

LEADERSHIP CAPACITY IN A COMPLEX CONNECTED AGE

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Doctor of Education

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By

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## DEDICATION

*In honor of my family, especially my parents, wife and daughter, who truly are the  
wind beneath my wings.*

*To my wife, Marie, who challenges me to pursue my dreams and yet keeps me real and  
grounded.*

*To my daughter, Rachel, who I hope I inspire to achieve her fullest potential and  
whose zest for life inspires me.*

*To Dr. Barbara Martin, who pushed me hard to get this dissertation done and whose  
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# LEADERSHIP CAPACITY IN A COMPLEX, CONNECTED AGE

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## ABSTRACT

*There is a great deal, in the writing of poetry, which must be conscious and deliberate. In fact, the bad poet is usually unconscious where he ought to be conscious, and conscious where he ought to be unconscious.*

T.S. Eliot, Tradition and the Individual Talent, 1922

The purpose of this study was to investigate the ways in which Social Network Analysis (SNA) could inform leadership capacity by making explicit often hidden social networks that exist within organizations. SNA is a relatively new analytical tool and, to date, little used in the educational domain. Although it provides a quantitative means to examine social networks, its true benefits lie in the conversations it sparks when those networks are visualized and presented to those who inhabit them.

The study was undertaken in three phases within a small, Midwestern school district. In the first phase, a face-to-face interview was conducted with the superintendent. The same set of questions posed to the superintendent was then asked of the districts senior leaders, comprised of the deputy and assistant superintendents, and building administrators (principals). The second phase comprised of two surveys: a SNA survey and Lambert's (2003) Leadership Capacity School Survey, administered to the senior leaders as well as their administrative assistants (N=15). The final phase was a group interview with the senior leaders (superintendent, deputy and assistant superintendent, and principals) in which the results of the two surveys were presented in visual form and used to guide discussion and discovery.

The data from these various sources were tabulated and analyzed, yielding a series of network visualizations and six themes. The first two themes emerged from the network visualizations produced by the Organizational Risk Analyzer (ORA) software application employed to conduct the SNA. They included the fact that individuals tended to form cliques with their own kind, based largely on role or function; and that individuals and sub-groups tended to be fragmented or isolated. The other four themes emerged in oppositional terms and included: vision versus managed programs; collaboration versus isolation and fragmentation; trust versus suspicion and avoidance; transparency versus opaqueness and guardedness.

From these themes were identified four findings. The first was that hierarchical or formal structures continue to hold sway. The second was that “birds of a feather” do indeed flock together. The third was that collaboration, trust, and transparency are interdependent and undergird capacity. The fourth was that social networks *are* the organization, making SNA an essential diagnostic and decision-making tool.

The findings led to a number of implications for practice, which were framed by Information Age imperatives arising from the literature. Also discussed were implications for future research, which are immense.

## CHAPTER ONE

### INTRODUCTION TO THE STUDY

#### *Background*

The challenges facing society, organizations, and leaders are more complex than ever. In the educational realm, these challenges are social, institutional, and professional in nature and run the gamut from ensuring school safety and dealing with funding uncertainties to assuring equity in achievement (G. F. Carruth, personal communication, November 3, 2008; Kowalski, 2006). The adage goes that insanity is doing the same thing and expecting different results. In the face of the complex challenges confronting organizations of all types, new conceptualizations and forms of leadership are needed (Bolman & Deal, 2003; Drath, 2003; Heifetz, 1994; Lambert, 2002; Martin, 2007; Wheatley, 1999). The task seems increasingly daunting, but Wheatley (1999) offers hope:

I no longer believe that organizations are inherently unmanageable in this world of constant flux and unpredictability. Rather, I believe that our present ways of organizing are outmoded, and that the longer we remain entrenched in our old ways, the further we move from these wonderful breakthroughs in understanding that the world of science calls “elegant.” The layers of complexity, the sense of things being beyond our control and out of control, are but signals of our failure to understand a deeper reality of organizational life, and of life in general. (p. 5)

Organizational life and leadership are some of the most studied dimensions of human experience but also some of the most difficult to grasp with definitiveness and confidence (Bolman & Deal, 2003; Burns, 1978; Leithwood, Jantzi, & Steinbach, 2000; Yukl, 2006). According to Yukl, fascination with leadership, in particular, stems from the

fact that it touches every person's life but remains a fundamentally mysterious process. The difficulty in defining it can be explained using Lofti Zadeh's Law of Incompatibility. This law states that as concepts become more complex, the language used to define them becomes increasingly imprecise. "Whereas simple concepts are typically open to crisp definition, complex concepts are usually defined vaguely" (Leithwood, Jantzi & Steinbach, p. 6). Either this or the language becomes increasingly voluminous (Bar-Yam, 2004). On the one hand, this insight dooms the study of leadership to vagueness and imprecision or to verbosity. On the other hand, it offers a challenge that opens up continual new possibilities (Cilliers, 2004).

If complex concepts are susceptible to vagueness and misunderstanding, perhaps the right phenomena are not being studied or all of the right tools being employed. Overcoming these limitations and discovering elegant solutions to problems facing organizations and leaders in the Information Age means harnessing radically new concepts, models, and tools, such as complexity theory and social network analysis (Andriani & Passiante, 2004; Barbási, 2002; Bar-Yam, 2004; Cross & Parker, 2004; Krebs, 1996; Watts, 2003). These new concepts, models, and tools, in turn, point to new ways of leading and learning. The journey to discovery will not happen overnight, but it will result in a "simpler way to lead organizations, one that requires less effort and produces less stress than our current practices" (Wheatley, 1999; p. 5).

A fundamental premise of complexity is that it and simplicity, chaos and order, co-exist (Watts, 2003; Wheatley, 1999). The very factors that make systems and the world complex (such as technology) also serve as potential solutions to understanding and harnessing that complexity (Andriani & Passiante, 2004; Bar-Yam, 2004). That was

the purpose of this study: to see if there were ways to harness Information Age tools to examine leadership within educational organizations so as to discover underlying schemas that enable educational leaders to deal successfully with what appear, on the surface, as inordinately complex and intractable problems.

*Outside the schoolhouse: A brave and complex new world*

Solving complex problems first demands an understanding of complexity in the Information Age (Andriani & Passiante, 2004; Bar-Yam, 2004; Heifetz, 1994; Wheatley, 1999). The world has changed, not simply in fundamental ways, but also in radical ways—ways that complicate all aspects of human existence.

According to Wallis and Steptoe (2006), the educational system has not kept pace with the unprecedented change of the last quarter century.

American schools aren't exactly frozen in time, but considering the pace of change in other areas of life, our public schools tend to feel like throwbacks. Kids spend much of the day as their great-grandparents once did: sitting in rows, listening to teachers lecture, scribbling notes by hand, reading from textbooks that are out of date by the time they are printed. A yawning chasm (with emphasis on yawning) separates the world inside the schoolhouse from the world outside. (¶ 2).

This “inside/outside” paradigm provides a useful lens through which to view the challenges facing education at this moment in time. Because education seeks to prepare young people to exist within their communities and the larger world (to function as contributing citizens), it must show an awareness of the forces that are shaping the world (Pring, 1999), forces that affect humankind on all fronts.

Recently, the United States Army published a major revision to its capstone doctrinal publication, Field Manual (FM) 3-0, *Operations* (2008). The revision was made necessary because the “operational environment” had so radically changed (p. 1-1). Among the important trends that FM 3-0 highlights as affecting the environment in which the Army must operate in the near to mid future are: (a) globalization, (b) technology, (c) demographic changes, (d) urbanization, (e) resource demand and scarcity, (f) climate change and natural disasters, (g) proliferation of weapons of mass destruction and effects, (h) failed or failing states (p. 1-1). Of course, these trends do not exist in isolation. In combination they create a global environment of chaos and uncertainty, where predictability is rare, and linearity and determinism are increasingly irrelevant, if not dangerous forms, of thinking (Paparone, 2008; Wass de Czege, 2008).

Why mention these trends and what do they have to do with the schoolhouse? Just as the Army must prepare to operate in this increasingly complex, inter-connected, and oftentimes ambiguous environment (what the military terms an era of instability and persistent conflict), the American educational system must prepare itself and its students to exist and thrive in a world defined and shaped by these very same attributes. According to Wallis and Steptoe (2006), one of the limitations stemming from being out of step with the times is the mistaken belief that the schoolhouse is isolated from the larger world. This fact forms the heart of a national conversation educators are *not* having about education, “one that will ultimately determine not merely whether some fraction of our children get ‘left behind’ but also whether an entire generation of kids will fail to make the grade in the global economy because they can’t think their way through abstract

problems, work in teams, distinguish good information from bad or speak a language other than English” (§ 3).

*Inside the schoolhouse: The leadership challenge in educational organizations*

In 1983, the National Commission on Excellence in Education issued a report, titled *A Nation at Risk*. It was a call to arms for the nation, shedding light on evidence that clearly showed the precipitous decline of America from its once vaunted status as the world’s leader in commerce, science, technology, and innovation. The Commission reported that “a rising tide of mediocrity” threatened America’s future. In language emblematic of the Cold War and the Reagan presidency, the report soberly concluded, “We have, in effect, been committing an act of unthinking, unilateral educational disarmament” (U.S. Department of Education [DOE], *Nation at Risk*, § 2).

Among its findings, the report cited failings and weaknesses at all levels. The nation had grown complacent about its pre-eminent status, parents had abrogated their responsibilities to serve as role models and disciplinarians, superintendents and principals had allowed curriculum to get watered down and had failed to enforce standards, teachers had allowed “good enough” to substitute for disciplined work, and students consequently had abandoned holding themselves accountable for their best work (DOE, *Nation at Risk*, 1983). One of its chief recommendations to correct these deficiencies was implementing clear, rigorous, and measurable standards, which over time led to the Bush Administration’s *No Child Left Behind* legislation (2002). Among the other recommendations, the report called for stronger and better educational leadership. Its authors asserted that superintendents and principals played a critical role in harnessing

school and community support necessary to implement reforms successfully. The report went on to say,

The Commission stresses the distinction between leadership skills involving persuasion, setting goals and developing community consensus behind them, and managerial and supervisory skills. Although the latter are necessary, we believe that school boards must consciously develop leadership at the school and district levels if the reforms we propose are to be achieved. (DOE, *Nation at Risk*, Recommendation E, ¶ 1)

In 2008, the United States Department of Education published a 25-year follow up to *A Nation at Risk* (DOE, 1983), titled *A Nation Accountable*, which explores how far the United States has advanced on the findings and recommendations of the 1983 report. The conclusion of the 2008 report is that despite improvements in many areas, significant shortfalls still exist. Many areas of America's education system remain mediocre, at best. Language and math proficiency has shown only marginal gains, and "performance at the high school level is as alarming as it was at the time of *A Nation at Risk*, if not worse" (p. 10). Dropout rates among high school students remain alarmingly high, especially among inner-city minority students. Interestingly, the report includes little on the issue of leadership. It points to increased selectivity among educational administration programs and innovative organizations such as New Leaders for New Schools, but it essentially echoes the 1983 report in citing the need for leaders who do more than manage.

Consistently, along with recommendations for improved curriculum, standards, teacher performance, funding, and acceptance criteria (for entrance into colleges and universities), these commissions concluded that leadership was crucial to improving

education for all students, although their reports fail to examine the issue of leadership in any depth (DOE, *Nation at Risk*, 1983; DOE, *Nation Accountable*, 2008). If the current challenges facing education are indeed a test of leadership, several related questions arise: why has the United States not done better over the past 25 years improving public education; will the United States, as a nation, ultimately pass the test; and if so, how?

*Convergence complexity: inside challenges meet outside realities*

In its 2007 report titled *Tough Choices OR Tough Times*, the New Commission on the Skills of the American Workforce situated America's educational decline within the current global context, arguing that the United States must accelerate schoolhouse improvements or risk being overtaken by countries such as India and China, which are producing a highly skilled labor pool willing to work for less. The Commission argued that a century ago America led the world in vertical integration, while today, it leads the world in *disintegration* through outsourcing and mechanization (the use of intelligent machines to replace human labor). The upshot of this new reality is that the most vulnerable jobs are and will be the ones involving routine work, the sort of work that a mediocre education prepares one to perform (National Center on Education and the Economy [NCEE], *Tough Choices*). If America is to compete globally, it must offer something other countries cannot: highly innovate products, services, and technologies that emanate from

A deep vein of creativity that is constantly renewing itself, and on...people who can imagine how [others] can use things that have never been available before, create ingenious marketing and sales campaigns, write books, build furniture,

make movies, and imagine new kinds of software that will capture people's imagination and become indispensable to millions. (NCEE, *Tough Choices*, p. 6)

This deeply imaginative and creative workforce must be comfortable with abstract ideas, be able to analyze and synthesize large amounts of data in real time, be highly self-disciplined and organized, have strong interpersonal and collaborative skills, and be highly flexible and adaptable (NCEE, *Tough Choices*, 2007). But according to the Commission, America's educational system is still too wedded to the industrial age, what Bar-Yam (2004) characterized as an anachronistic "mass production approach to child development" (p. 191).

#### *Information Age leadership*

If the current global environment is indeed chaotic and uncertain, if complexity underpins every system and process and if determinism is no longer consistently operative, what are educational leaders to do? The literature increasingly offered a number of new strategies that spoke to the need to rethink the ways in which leadership is enacted (Andriani & Passiante, 2004; Bar-Yam, 2004; Brafman & Beckstrom, 2006; Cilliers, 2004; Cross & Parker, 2004; Drath, 2003; Jullien, 2004; Kelly, 2003; Krebs, 1996; Lambert, 2002, 2003; U.S. Army, 2008; Weick, 2008; Wheatley, 1999).

*Think more complexly.* Bar-Yam (2004) argued that in order to exist and survive in a complex environment, organizations must think and behave complexly. Andriani and Passiante (2004) employed the metaphor of "open source" to define a leadership capacity that is available to all members of the organization and that continually balances stimulation and constraint. They argued that decisions have to be made at the level at which the relevant information resides and be distributed dynamically between top-down

control and bottom-up percolation. Hierarchies may, in some instances, be necessary for purposes of accountability and responsibility but not in order to dictate how employees act and think. “Rather complex leadership requires a system in which managers facilitate the speedy coevolution of the organization (or part of it) with the relevant external environment” (p. 12). Drath (2003) stated that the first step to dealing with complex problems may, at first, seem counterintuitive: to create even more complex capacity. “A complex capacity to respond means something different from just a more complicated process. It means a more varied, less predictable, more layered process capable of greater subtlety” (p. 6).

In the Information Age, with open source models such as Wikipedia defining new forms of collaboration, organizations must quickly adapt similar models or risk irrelevancy (Andriani & Passiante, 2004; Brafman & Beckstrom, 2006; Cross & Parker, 2004; Krebs, 1996; Martin, 2007). Coevolution of the organization requires new structures of organizing, learning, and working, new structures based on new ways of seeing (Kelly, 2003; Wheatley, 1999). Kelly (2003) offered a number of metaphors that capture emergent organizational structures, among them networks, complex adaptive systems, swarm systems, vivisystems, and collective systems. All of these systems are highly diverse and diffuse. There is no clear organizing center, yet a sort of collective mind exists nonetheless, what Kelly terms the invisible hand of control without authority (Chap. 2, Asymmetrical invisible hands, ¶ 7). The network is quickly becoming that structure that best adapts to a complex, globalized, information-saturated, diverse, and inter-connected world.

The only organization capable of unprejudiced growth, or unguided learning, is a network. All other topologies limit what can happen. A network swarm is all edges and therefore open ended any way you come at it. Indeed, the network is the least structured organization that can be said to have any structure at all. It is capable of infinite rearrangements, and of growing in any direction without altering the basic shape of the thing, which is really no outward shape at all. (Kelly, 2003, Chap. 2, Network is the icon of the 21<sup>st</sup> century, ¶ 13-14)

The struggle for leaders who are used to hierarchical control is how to master what Kelly (2003) termed “noncontrol” (*Out of control*, Chap. 2, Network is the icon of the 21<sup>st</sup> century, ¶ 11), allowing the benefits of the network or swarm to thrive while, at the same time, minimizing its disadvantages. Social network analysis offers one tool to find an appropriate balance between straightjacket control and chaos (Cross & Parker, 2004; Krebs, 1996).

*Let go.* Army Field Manual 3-0, *Operations* (2008) posited that in a highly complex and uncertain environment, “predictability is rare, making centralized decisionmaking and orderly processes ineffective” (p. 3-6). It instructed them to delegate to the maximum degree possible in order to retain flexibility and initiative. In other words, formal leaders need to let go and empower leaders at every level to contribute based on their relevant and immediate knowledge (what the military terms situational awareness). Brafman and Beckstrom (2006) argued that there is a “sweet spot” along the continuum between tightly-controlled hierarchical organizations and open source, leaderless organizations. The primary challenge of leadership is finding this sweet spot. Andriani and Passiante (2004) offered the following construct:

As the flow of information is so much greater in the network economy, all employees can be considered as ‘knowledge workers’ who create information-based products underpinned by an ongoing network of conversations. Managing a high rate of innovation in an uncertainty dominated environment calls for constant renewal, often a radical departure from the past, of the web of conversations that are centred upon each agent. When the set of overlapping webs of conversation coalesces around a macro-strategy, then a powerful link is established between the micro and the macro levels. The glue between the multiple aggregation levels of a complex organization comes to be the main task of modern leadership. (p. 12)

*Expand capacity at all levels.* Letting go means expanding leadership capacity at all levels, a fundamental tenet of constructivist leadership (Drath, 2003; Lambert, 1998, 2003, 2005). The inverse also proves true: by expanding capacity, managers are more readily able to let go. Lambert (2003, 2005) defined capacity as the intersection of broad-based and skillful participation. This means that managers must cultivate both. Drath (2003) called on three capabilities to create complex capacity: shared sensemaking, connection, and navigation, the last of which is the ability to continually assess and course-correct toward an uncertain point on the horizon. There is no known destination; rather, through inter-connected and shared sensemaking, the organization learns to arrive at the right destination, or rather makes each destination along its route right for that moment and time. Krebs (1996) added trust to the list of capabilities that managers need to cultivate. “Trust is the glue and the grease that ensures networks operate at their peak. Trust is the foundation of three known advantages of networks” (p. 3). These advantages include minimized transaction costs because trust limits opportunism and the need to

blame others; more efficient problem-solving based on shared situational understanding and knowledge; and network adaptability and survival.

*Move toward profound simplicity.* Weick (2008) asserted that “we are all struggling with events that don’t make sense” (*Leadership when*, ¶ 1). A noted theorist on sensemaking, especially during chaotic or disastrous events, Weick argued that in the face of uncertainty, individuals tend to grasp for old or ready-made solutions rather than being agile and attentive to new ones. People progress, he continued, through three stages: superficial simplicity, confused complexity, and profound simplicity. Superficial simplicity is often apparent in the impulse to flee in the face of chaos or to rush to quick explanations or causes. Confused complexity occurs when the superficial explanations begin to break down and leaders continually attempt to over-control the uncontrollable. Profound simplicity is the recognition that complex problems demand complex solutions that can only result through a process of shared and evolving sensemaking. “The skill of a leader involves not being paralyzed by confused complexity, not allowing others to give up when their confusions are complex, and providing resources that enable the recovery to keep moving” (Weick, 2008, *Leadership when*, ¶ 6). Profound simplicities are “seasoned simplicities, simplicities that have been tested by mentally simulating their consequences, simplicities that reaffirm what it means to be a human being” (¶ 5).

Profound simplicity echoes Eastern philosophical thought, which offers a countervailing view to the Western tradition that informs much of our thinking about sensemaking, decision-making, and leadership. In *A Treatise on Efficacy*, François Jullien (2004) compared Western and Chinese thinking about the nature of actions and effects. In the Western tradition, history is comprised of great acts, while in the Chinese tradition,

history is one of continual transformation. In the former, the only way to deal with uncertainty is to take bold, decisive action, which is ephemeral. In the latter, no seismic action is taken but efficacy is nonetheless achieved:

For, in contrast to action that, even if it is prolonged, is necessarily momentary, the duration of transformation is extended; and it is this continuity that produces effects. Chinese thought constantly returns to this theme. However imperceptible the starting point, by slowly accentuating its propensity, one can end up with the most decisive results. (Jullien, 2004, p. 55)

Put another way, Chinese philosophy argued that rather than imposing effects on the environment, man must allow effects to impose themselves. Weick (2008) argued that dealing with complexity requires persistent sensemaking that equates to transformation: “sensemaking is dynamic and requires continuous updating and reaccomplishment. As a leader, don’t let people languish in the feeling, ‘Now we have it figured out.’ They don’t have it figured out” (*Leadership when*, ¶ 6, bullet 6). Dealing with the inexplicable is about telling stories about what is being faced and how to deal with it; but the stories constantly evolve based on new information. Profound simplicity means allowing these stories to unfold (Weick).

*Start small.* Eastern thought suggested that lasting change is effected through continual small adjustments rather than intermittent major ones. Rather than taking decisive, bold action, leaders need to allow action to unfold organically and naturally (Jullien, 2004). Weick (2008) argued that instead of thinking then doing, individuals must think *while* doing or think *in* doing. “All we have going for us is the tactic of stumbling into explanations that work and talking with others to see whether what we have

stumbled into is in fact part of the answer” (*Leadership when*, ¶ 6, bullet 8). Social network analysis offers a tool to harness this “stumbling into explanations” through the webs of interactions and conversations that occur on a daily basis within organizations (Cross & Parker, 2004; Krebs, 1996). Social network analysis provides one piece to the larger puzzle of meaning and one that is simultaneously manageable and illuminating.

In brief, achieving Information Age leadership requires using Information Age tools, such as social network analysis, to make explicit the ways that human collectives—such as a district administrative team—self-organize so that inherent and organic ways of dealing with a complex world can be studied and harnessed more effectively. The goal is not to rigidify these structures but discover the factors that give rise to them so that they may be cultivated and encouraged. Social network analysis offers a way to start small and grow the complexity and capacity of an organization.

#### *Conceptual Underpinnings of the Study*

To achieve a richer, more nuanced exploration of leadership, this study employed several conceptual frames or lenses and also sought to amplify their inter-relationship. The first was organizational theory and its evolution (Bensimon, Neumann, & Birnbaum, 1989; Bolman & Deal, 2003; Foster, 1986; Morgan, 1997). Tied to the evolution of organizational theory was the evolution of leadership theory (Weick, 2008; Wheatley, 1999; Yukl, 2006). Their parallel development revealed a natural progression towards more complex conceptualizations of leadership, out of which arose constructivist theory and its subset theory of capacity (Lambert, 2002, 2003; Walker, 2002). Embedded in the discussion of the evolution of organizational and leadership theories was complexity theory (Andriani & Passiante, 2004; Bar-Yam, 2004; Cilliers, 2004). The final conceptual

frame was that of social network and small world theory (Barabási, 2002; Krebs, 1996; Watts, 2003), which expanded the possibilities for understanding leadership capacity and complexity and the ways in which they operate in organizations, particularly through the use of Social Network Analysis or SNA (Wasserman & Faust, 1994; Cross & Parker, 2004).

### *Organizational and leadership theories*

Organizational theory has its roots in the rise of increasingly complex organizational structures. Bolman and Deal (2003) stated that organized society and institutions date back approximately ten to fifteen thousand years out of a history of human existence of more than 12 million years, but it has only been in the last century that theories of organizations and organizational behavior have arisen.

Theories of organizations and of leadership tend to follow the prevailing philosophical orientation of both society and the researcher (Foster, 1986; Yukl, 2006). Thus, in the early years of analysis, organizations were viewed scientifically, the result of a positivist way of seeing the world (Foster). “Logical positivism asserted that only scientific knowledge, which was verifiable in principle, was true knowledge and could be expressed in logical, and therefore true, form” (p. 35). Organizations were viewed as fixed entities, knowable objects that could be dissected and studied empirically to determine what made them tick. From this epistemological framework arose the first theories of organization and leadership, namely structuralism and scientific management (Foster).

Organizational theory has evolved as new epistemological frameworks have been applied to research and practice but also as other fields of study have been brought to

bear (Foster, 1986). For example, after the Hawthorne studies revealed the importance of the human factor in organizational performance, emerging research in the fields of psychology and the social sciences were brought to bear to the study of organizations (Bolman & Deal, 2003; Foster). As positivist and structuralist views yielded to constructivist, post-structuralist and post-modernist views on the nature of reality and truth, theories of organizations and the leadership needed to govern them have become more complex (Bensimon, Neumann, & Birnbaum, 1989). These theories recognize that organizations are hives of social, political and symbolic interactions that exist within a sort of ecosystem of inter-dependent entities that are both self-regulating and subject to their environments (Bolman & Deal, 2003; Morgan, 1997).

Morgan (1997) argued that theory is, at its root, a metaphor through which humans understand the world about them. Theory has a two-fold quality to it: it arises from ways of seeing but also affects those ways of seeing: “All theories of organization and management are based on implicit images or metaphors that lead us to see, understand, and manage organizations in distinctive yet partial ways” (p. 4). More complex theories of organizations and leadership, which are needed to deal with both vexing problems and intriguing possibilities, are made possible only when ways of seeing are complicated, either within themselves or in combination (Bolman & Deal, 2003; Morgan; Wheatley, 1999). Ultimately, as both Wheatley and Weick (2008) concluded, moving through complexity can bring about profound simplicity, a simplicity that only makes sense when placed in bas relief against the evolved theory preceding it.

### *Constructivist leadership theory*

As its name implies, constructivist leadership theory emanates from a phenomenological worldview in which meaning arises—or is constructed—through what Wilson (2002) termed intersubjective experience.

Our experience of the world, upon which our thoughts about the world are based, is intersubjective because we experience the world with and through others.

Whatever meaning we create has its roots in human actions, and the totality of social artifacts and cultural objects is grounded in human activity. (¶ 14)

Put another way, everything arising from an organization—its knowledge, collective will, action, purpose, even its leadership—is constructed by the members of the organization, a product of their internal and external interactions with their environment (Lambert, 2002; Walker, 2002).

Constructivist theory views leadership as a dimension of the entire organization “beyond person and role and embedded in the patterns of relationships we will refer to as ‘reciprocal processes’” (Lambert, 2002, p. 42). These reciprocal processes subsequently “enable participants in an educational community to construct meanings that lead toward a shared purpose of schooling” (p. 42). Leadership is strongly tied to learning and “addresses the need for sensemaking, for coherence, and for seeing educational communities as growth-producing entities” (p. 35). In short, within constructivist organizations, everyone learns and is engaged in the acts of reflection, inquiry, exchange, and knowledge making. “The function of leadership must be to engage people in the processes that create the conditions for learning and form common ground about teaching and learning” (p. 35).

In the context of this study, constructivist leadership not only defines leadership a particular way, it also creates the conditions whereby leadership is inevitably and simultaneously redefined, using such tools as storytelling, directed conversations, mentoring, and metaphor, all of which lead to “new modes of discourse, to new ways of risking a breaking of frames” (Greene, 2002, p. ix). Constructivist leadership is, at its heart, also de-constructivist, in that it enables organizations perpetually to reconceive what’s possible. In so doing, leadership, according to Greene, becomes an act of release: “Persons are freed to envisage what might be and what should be, even as they are supported in their efforts to devise their projects in an always ambiguous world” (p. ix).

#### *Leadership capacity*

In her best seller, written when she was still First Lady, Senator Hillary Rodham Clinton nourished the idea that advancing the welfare of children was everyone’s business:

The simple message of *It Takes a Village* is as relevant as ever: We are all in this together....We can restore our children’s stake in the American Dream, and the promise that if you work and play by the rules, you can succeed in this country.

But there is much work to do, and it will take every member of the village to get it done. (2006, p. xviii)

Lambert (2003) asserted that within the context of education, “village” or “community” tends to be synonymous with a gathering of people in a social setting. “But real communities ask more of us than merely to gather together; they also assume a focus on shared purpose, mutual regard and caring, and an insistence on integrity and truthfulness” (p. 4). The upshot of working and learning together in community, she

concluded, is creating an environment in which everyone feels worth and harmony. “Inherent in this view is the belief that all humans are capable of leadership, which complements our conviction that all children can learn” (p. 4).

From this conviction arises the notion of leadership capacity, which Lambert (2005) defined as “broad-based, skillful participation in the work of leadership that leads to lasting school improvement.” Capacity is therefore framed as the intersection of degree of participation and degree of skill, with low capacity schools scoring low in both dimensions and high capacity schools scoring high in both. More than anything else, the quality of a school depends on the quality of the conversations that take place within the school community (Lambert). To enable these conversations, schools must consistently return to the first tenet of capacity: being broad-based.

Schools must create the structures through which participation occurs. Structures for broad-based participation include teams, study groups, vertical communities, and action research teams. These are the settings in which people deepen relationships, alter their beliefs, and become more skillful in the work of leadership. Without these structures, reculturing is unlikely. (Lambert, p. 40)

While broad-based and skillful participation characterizes a high-capacity organization and lessens the need for command-and-control leadership, formal leaders still play a critical role in fostering and sustaining capacity (Lambert, 2003). Within education, superintendents and principals can serve as the initial impetus to overcome “dependency behavior” among school staffs and encourage and model capacity-building behaviors (p. 48). Most especially, they facilitate the creation of a shared vision and the conversations necessary to grow capacity.

### *Complexity theory*

Viewed another way, capacity is complexity or the ability to increase connections and reciprocal relationships, an essential tenet of constructivist leadership (Lambert, 2002). Bar-Yam (2004) defined complexity as “the collective behaviors of a system and how the system interacts and forms relationships with its environment” (p. 24).

Complexity is comprised of emergence, “the relationship between the details of a system and the larger view” (p. 27) and interdependence, the notion that every part of a system is integrally connected to another. Understanding the relatedness of the parts and how they interact is essential to understanding system complexity.

Cilliers (2004) amplified the definition of complexity, stating that

Complexity is the result of a rich interaction of simple elements that only respond to the limited information each of them are presented with. When we look at the behavior of a complex system as a whole, our focus shifts from the individual element in the system to the complex structure of the system. The complexity emerges as a result of the patterns of interaction between elements. (p. 24)

One manifestation of this emergent complexity is system “consciousness” (p. 24), which can only exist at the aggregate or network level. Within organizations, complexity is achieved through enriched connections between and among people: “Getting relationships to work in new ways requires people to see patterns of connection (and disconnection) in order to explore root causes of the complex challenge and clarify differing and sometimes conflicting values” (Drath, 2003, pp. 6-7).

### *Network and small world theories*

Capacity speaks to the ability to harness communities to achieve common purpose (Lambert, 2005). Yet anyone who exists within such communities knows that they are complex hives of social interaction that often resist attempts to control and synchronize them (Drath, 2003). To build capacity, Lambert (2003) advocated creating structures for broad-based participation. She stated that “full participation is first and foremost a function of design” (p. 18), which overlays a structuralist framework onto a post-structuralist vision of leadership. This inherent dichotomy is precisely the message that emerges from social network theory. Structure and chaos, complexity and simplicity, robustness and fragility are not polar opposites or mutually exclusive; they coexist in complex systems (Barabási, 2002; Bar-Yam, 2004; Watts, 2003; Wheatley, 1999).

Network and small world theories reveal that a wide range of phenomena are simultaneously ordered and disordered, complicated and simple (Barabási, 2002; Watts, 2003). Human tendency is to impose structure, particularly within organizations, without seeing or accounting for inherent, organic, embedded or virtual structures which play as important a role, if not more so, in defining and regulating the system (Cross & Parker, 2004; Krebs, 1996; Stamps & Lipnack, 2008).

Network and small world theories seek to explain the aggregate behavior of complex systems, whether it is electric power grids, crickets chirping synchronously, or human social networks (Watts, 2003). As complexity theory argues, the challenge of aggregate behavior is that the sum is truly greater and different from the mathematical sum of its parts. Social networks, for example, behave in ways that cannot be explained by thinking of a crowd as merely a collection of individuals. “What makes complex

systems complex, is that the parts making up the whole don't sum up in any simple fashion. Rather they interact with each other, and in interacting even quite simple components can generate bewildering behavior" (p. 26). According to Watts and Barabási (2002), complex systems, especially human networks, have a flip side: despite their complexity, they can and do operate in surprisingly simple and predictable ways. "As capricious, confusing, and unpredictable as individual humans typically are, when many of them get together, it is sometimes the case that we can understand the basic organizing principles while ignoring many of the complicated details" (Watts, p. 26). Added Barabási, "Each time nature is ready to spin a new web, unable to escape its own laws, it creates a network whose fundamental structural features are those of dozens of other webs spun before" (p. 221).

What network and small world theories suggest is that capacity is both a function of formal design and structure (think hierarchical organizations) and informal networks that exist or co-exist within the formal structure but, until recently, have not been understood in a systematic way. Like tacit and explicit knowledge, capacity can be strengthened through a spiral process of converting tacit structures into the explicit ones. According to Krebs (1996), organizational charts are prescriptive when it comes to work processes and information flow; as such, they fail to capture a "complex web of informal interactions" that exist on a subterranean level within the formal structure (p. 397). Illuminating these informal interactions through Social Network Analysis (SNA) becomes essential "in order to identify not only clear breakdowns in cooperation and sharing but also opportunities to strengthen viable but imperfect elements of the 'collaborative fabric'" (p. 397).

### *Social network analysis*

The means to illuminate these webs of interactions is made possible through social network analysis (SNA). Social network analysis blends quantitative and qualitative methods to examine an organization in terms of its “patterns or regularities in relationships among interacting units,” most especially people (Wasserman & Faust, 1994). Wasserman and Faust noted several characteristics fundamental to SNA. First, actors and actions are considered interdependent, rather than as autonomous. Such interdependency is more pronounced in a world characterized by “delaying, globalization, and the rise of knowledge-intensive work (Cross & Parker, 2004, p. vii). Second, ties exist among these actors, which are channels for the transfer of material and non-material resources. Third, the network structure that exists between and among actors provides both opportunities for and constraints on individual action. Fourth, SNA models network structure that is viewed as lasting patterns of relationships among actors (lasting does not mean unchanging; structures will change but there will always be a structure of relationships that exists among actors).

Social network analysis offers a unique means to explore informal (and often invisible) networks within organizations, which are increasingly recognized as critical to way organizations really function and optimize performance (Cross & Parker, 2004). “These seemingly invisible webs have...become central to performance and execution of strategy....Appropriate connectivity in well-managed networks within organizations can have substantial impact on performance, learning and innovation (Cross & Parker, p. vii). For the purposes of this study, social network analysis was viewed as a way to explore

complexity- and capacity-building features that otherwise would be missed in an educational organization.

### *Statement of the Problem*

In a complex world, leaders need to think and operate complexly, and leadership itself needs to be reconceptualized to account for this complexification (Andriani & Passiante, 2004; Bar-Yam, 2004; Drath, 2003; Heifetz, 1994; Martin, 2007; McKelvey, 2004; Weick & Sutcliffe, 2001; Wheatley, 1999). This study attempted to mitigate some of the limitations of leadership research cited by Yukl (2006), among them the tendency to oversimplify leadership by viewing it as the singular domain of the person-in-charge and to view it as simply dyadic (between a single leader and a single follower) rather than as multi-nodal or collective. Yukl argues that a more balanced approach is needed, one that includes an analysis of the mediating variables that explain the nature of influence more effectively. In short, research must be more complex. It must do more than merely show that one variable affects another: it must reveal why a range of variables interact the way they do.

Newer theories of leadership have recognized that leadership is an attribute of the entire organization (Barth, 1990; Bar-Yam, 2004; Donaldson, 2001; Hord, 2004; Lambert, 2002; Ogawa & Bossert, 1995; Shapiro, 2000; Walker, 2002). Among these newer theories, constructivist leadership offers considerable promise in its ability to reconceptualize leadership to meet the complex demands facing school leaders today (Greene, 2002). Constructivist theory views leadership as capacity rooted in patterns of relationships (Lambert, 1998, 2002, 2003). At its essence, capacity is complexity and vice versa. Each and both are also forms of power: “Power, then, is a capacity that a

community of people attains when their acts of communication, cooperation, and collaboration have been successful (Brunner & Schumaker, 1998).

Bar-Yam (2004) argued that organizations operate on a continuum of complexity. Hierarchical organizations are complex but only as complex as the person in charge. Fully networked, often leaderless, organizations are highly complex, while hybrid organizations exist in between. Citing the law of requisite variety, Bar-Yam concluded that organizations and their leadership must be complex because the environment is complex. “A complex environment is one that demands picking the right choice in order to succeed. If there are many possibilities that are wrong, and only a few that are right, we have to be able to choose the right ones in order to succeed. As a general rule, this requires high complexity” (p. 67).

The quest is to achieve greater complexity, capacity, and power to enact positive change by broadening the patterns of relationships to include everyone and to sharpen the skill with which participation within the community is enacted. “It is important to develop multiple ways for people to participate, and for each person to contribute in more ways than one” and in so doing create a “rich organizational pattern that brings everyone into more than one shared experience” (Lambert, 2003, p. 12).

Lambert’s (2003) use of the term “rich organizational pattern” suggests a dense connective network among community members, but within the constructivist worldview, the pattern is one that is consciously created. Social Network Analysis (SNA), modeled on network and small world theories, offers a countervailing viewpoint: that network structures exist on multiple levels, both formal and informal, and are interconnected; and that these structures abide by certain properties that, if captured and

measured, enable an organization to unearth hidden strengths and weaknesses that affect its capacity (Cross & Parker, 2004; Krebs, 1996, 2000, 2007; Stamps & Lipnack, 2008).

Because SNA is a relatively new tool from a still emerging discipline, the ways in which it can inform leadership capacity have received little attention. This study sought to examine capacity more descriptively and holistically as an organic dimension of school communities, with particular focus on district administrative teams, which play a crucial role in leading the improvement of school and student performance.

### *Purpose of the Study*

Given that organizations operate on multiple levels of human interaction, both formal and informal, and that many of the informal networks are both subterranean and little understood, capacity within organizations may not be harnessed as effectively as it could be, depriving them of the requisite complexity needed to deal with their complex environments. Lambert's call for "skillful participation" through structured interactions needs to be complemented with equal attention to mining informal networks and unstructured interactions. Krebs (2000) argues that in the 21<sup>st</sup> century, it is not human capital and content that makes the difference in organizational performance but rather social capital and connections. Krebs differentiates social from human capital by defining the former as "the ability to find, utilize and combine the skills, knowledge and experience of others" (p. 89); in short, social capital inter-connects and optimizes human capital.

The purpose of this study was to examine ways in which leadership capacity is enhanced through a more explicit understanding of social networks within a district administrative team, as revealed through SNA, and the resulting possibilities for the

“complexification” of collaboration, learning, sensemaking, and decision making. Also studied were how SNA results affected attitudes about organizational constructs and whether the emergent understanding of organic capacity influenced decisions to reorganize or otherwise alter the existing structure of the administrative team within the central office. Finally, the study examined how the district’s top leadership viewed SNA as a tool capable of producing meaningful change in the district’s ability to address some of its most intractable problems.

### *Research Questions*

Marshall and Rossman (1999) state that one of the challenges of qualitative research is to frame questions that balance flexibility—a “hallmark of qualitative methods”—with “do-ability.” (p. 38). Questions must therefore be “general enough to permit exploration but focused enough to delimit the study” (p. 38).

This study began with the broad question of whether new theories of leadership, ones that emphasized more diffused and networked patterns of interactions, would be useful in dealing with some of the most vexing problems confronting public school systems today. A review of the literature and, in particular, an examination of constructivist leadership and its related concept of capacity, along with network and small world theory, helped to bring greater clarity and focus to this overarching question, resulting in the following research questions:

1. What does social network analysis (SNA)—to be referred to as measures of connectedness—reveal about the nature of leadership capacity within the administrative team of a district central office?

2. How does leadership capacity—as measured by Lambert’s Leadership Capacity School Survey—inform the outcomes of the SNA and vice versa?
3. How do the SNA results affect attitudes of the district’s senior leadership concerning ways of working, organizing, interacting, and enhancing leadership capacity within the district?
4. How do the SNA results affect attitudes of the district’s senior leadership with regard to solving its most intractable problems?

#### *Limitations and Assumptions*

All research has inherent limitations. “No proposed research project is without limitations; there is no such thing as a perfectly designed study” (Marshall & Rossman, 1999, p. 42). Limitations help those employing the findings of any study to recognize not only what the findings are but also what they are not. Limitations and assumptions, therefore, bound and situate the study’s findings so that other researchers can subsequently employ them judiciously.

Another limitation is the very process of selecting theory through which to conduct the research and analyze findings. Morgan (1997) cautioned that theory is fundamentally a metaphor through which we understand the world about us. As such, theory is a lens that proscribes what a researcher sees and does not see. Without this lens or, as Merriam (1998) termed it, *theoretical framework* (or conceptual underpinning), research tends to lack focus: “This disciplinary orientation is the lens through which you view the world. It determines what you are curious about, what puzzles you, and hence, what questions you ask that in turn begin to give form to your investigation” (Merriam, p. 45). The tradeoff for focus, however, is a form of distortion or bias. Schwandt (1993)

claims that “Atheoretical research is impossible” (p. 7). Since theory guides the entire process of what is studied, how it is studied, how it is analyzed, and how it is reported, then any study is inherently limited. By choosing to employ Lambert’s conception of leadership capacity and the Organizational Risk Analysis (ORA) software to examine leadership capacity and social networks within the administrative team of a central office, this study limits a fully comprehensive understanding of leadership. Simultaneously, it opens a window through which to comprehend an under-attended aspect of leadership, which Wilson (2002) would remind us is not a single phenomenon.

A related limitation of this study resulted from the researcher’s particular selection of the Organizational Risk Analysis (*ORA*) software. *ORA* employs mathematical formulations to measure certain characteristics of social networks, which at best are approximations of human social behavior. This investigator chose *ORA* for its robustness and ability to assess characteristics of value and relevance to administrative teams, but he also chose it for pragmatic reasons: it was free and intuitively learnable. Additionally, the creator of the software, Dr. Kathleen M. Carley of the Center for Computational Analysis of Social and Organizational Systems (CASOS) at Carnegie-Mellon University, offered direct assistance, when needed. Through his military and corporate experience, responsible for implementing new software on an enterprise level, the investigator recognized that any commercial, off-the-shelf product offers trade-offs to its user. In exchange for its immediately availability, low cost, and learnability, it delimits any results to only what it has been programmed to calculate.

Sample selection had inherent limitations. By definition, qualitative research is context-dependent and not generalizable (Heppner & Heppner, 2004; Merriam, 1998).

This fact drives sample selection to be purposeful and nonprobabilistic (Merriam). “Purposeful sampling is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned” (Merriam, p. 61). In order to optimize sample selection, criteria for selection must be established. Heppner and Heppner advised that researchers select participants using two essential criteria: that participant has experienced the phenomenon under study and that they can articulate their “lived experiences” (p. 173). Rather unique to this study is the fact that social network analysis does not examine just any social network (or, rather, just any collection or grouping of people), but it examines a defined one that already exists. This reality means that sample selection is not a process of selecting discrete administrative team personnel but rather selecting the entire office. The assumption is made that all central office administrative teams have an inherent, embedded, virtual, or subterranean structure unique to that organization that can be made more explicit through SNA. While the specific findings of this study apply to the central office under scrutiny, the merits of SNA have broad application.

Another limitation of the study is that it analyzes a social network within a central office non-longitudinally. Social Network Analysis takes a snapshot of an organization at a particular moment in time, but organizations are living organisms (Morgan, 1997) that undergo continual change (as manifested through addition, attrition, and reassignment). In order to effectively understand how social networks operate within organizations, a longitudinal study is preferred but would require repeated intrusion on the unit of analysis (Fraenkel & Wallen, 2003). If this study had been purely survey-based, the impact on the organization could have been lessened, and a longitudinal study undertaken. In its mixed-

design, consisting of surveys and interviews, the study was sufficiently intensive—and disruptive—that the researcher opted to limit it to a single instance.

Cross and Parker (2004) outlined a number of limitations and challenges specifically associated with SNA:

1. Surveys only capture so much information about the network. Respondents may forget or misreport interactions, either consciously or unconsciously.
2. Surveys are only as good as the researcher who develops them and should be developed in close coordination with knowledgeable network members.
3. Social network analysis is constrained by the expertise of the analyst or researcher. This study was undertaken by a researcher with no previous background in SNA who taught himself the mechanics and processes.
4. Network diagrams are prone to misinterpretation: “diagrams can appear complex to someone looking at them for the first time, and occasionally managers will read into them what they want to see and overlook what the information is actually suggesting” (p. 140).
5. Network diagrams and data can lead to defensiveness and require a focus on the system and not on individuals.
6. Taken to an extreme, network diagrams can be used indiscriminately to take unwarranted personnel actions. The analyst must continually explain these limitations and contextualize the information to avoid such potential outcomes.

Watts (2003) warned of one other potentially significant limitation of SNA. It fails to account for the dynamics of social networks.

Instead of thinking of networks as entities that evolve under the influence of social forces, network analysts have tended to treat them effectively as the frozen embodiment of those forces. And instead of regarding networks as merely the conduits through which influence propagates according to its own rules, the networks themselves were taken as a direct representation of influence. (p. 50)

In other words, taken by itself, SNA, like other analytical tools, oversimplifies its object of study. A case in point, Watts posited, is the network measure of centrality, which presumes that networks that appear decentralized or leaderless are really not. Evidence exists that networks do emerge despite the absence of a clear central authority or control; yet in having a measure such as centrality, SNA seeks automatically to find a center—some influential player or power broker. He or she may be unexpected but once identified, Watts argued, we are back on comfortable ground because, after all, “the world always has a center” (p. 52). But, Watts asked, what if there truly is not a center or there are multiple centers? What SNA fails to account for by not capturing the dynamics of networks is that “*the center emerges only as a consequence of the event itself*” (p. 52).

Cross and Parker (2004) noted that SNA can cause defensiveness among participants if not handled carefully. This potential for defensiveness is particularly acute in small organizations. Along with the uncertainty surrounding an unknown tool like SNA, this guardedness could translate into the potential for a lack of candor and openness on the survey instruments and in response to interview questions.

#### *Design Controls*

Control was achieved through measures undertaken to mitigate threats that would compromise trustworthiness (Fraenkel & Wallen, 2003). One of the challenges facing a

qualitative researcher is the worldview that undergirds this form of research. Fraenkel and Wallen stated that validity deals with the “drawing of correct conclusions based on the data” gathered (p. 158). Correctness implies that there is a baseline of truth or reality to which conclusions can be compared to determine their “rightness” or “wrongness.” But in the qualitative research paradigm, reality is subjective and constructed, continually changing, most especially when studied by an external agent whose mere presence prompts change. As Merriam (1998) stated, “Assessing the isomorphism between data collected and the ‘reality’ from which they were derived is thus an inappropriate determinant of validity” (p. 202).

In answer to the question, how can a qualitative researcher assure internal validity and bolster overall trustworthiness, Merriam offered six basic strategies: triangulation, member checks, long-term observation, peer examination, collaborative modes of research, and the explication of researcher’s biases. This study employs all of these strategies except long-term observation, due to the impracticality of an extended intrusion into the unit of analysis.

*Triangulation.* Triangulation is the use of multiple investigators, sources of data or multiple methods to confirm emerging findings (Merriam, 1998). This strategy was achieved through the inherent nature of SNA, which relies on self-reporting of social interactions. While there are limitations (discussed below) with self-reportage, the process creates a form of cross-check in which one person’s recollection of interactions is validated by another’s. For example, if Actor A reports that he deals with Actor B on matters of discipline, Actor B is likely to report the same about Actor A. The result is not an exact replication of the network as it might exist but as close an approximation as

allowable without the use of prolonged observation. The study also employed methodological triangulation through its mixed-methods design.

*Member Checks.* This strategy, which involves having those about whom the study was conducted review the data and emerging interpretations (Merriam, 1998), was achieved through the process of having the leadership of the administrative team self-interpret the results of the Leadership Capacity School Survey and SNA. In essence, because the theoretical underpinning of this study was that meaning and learning are constructed by those involved in these processes, the meaning of the study could only result from self-analysis, guided by the researcher. This self-analysis also served to triangulate the data as it allowed multiple viewpoints in the assessment process.

*Long-term observation.* Wasserman and Faust (1994) note that there is inherent measurement error in sociometry. This error is the difference between the *true* structure of a network and the *observed* structure. True structure is the true interactions that take place on a continual basis. It is ever shifting and can only be approximated. Observed structure represents this approximation, as revealed through the measured network data (Wasserman & Faust). Data collected from prolonged observation by individuals outside the network tend to be “truer” than data collected in a single instance through self-reportage. Because this study did not undertake long-term observation, accuracy and validity were compromised. Participants were made aware of this shortcoming during Phase Three of the study.

*Peer examination.* Peer examination occurred on two levels. First, because the study sought to have its participants self-interpret the data, peer review was made an integral part of the analysis process. Second, the researcher also sought external peer

review of emergent findings by sharing them with experts in the use of the Organizational Risk Analysis (ORA) software, to ensure the researcher's analysis was reasonable and defensible.

*Participatory research.* This study was premised on a phenomenological worldview in which meaning is constructed through inter-subjective experience (Wilson, 2002). The administrative team under study fully participated in all phases of research, from helping to devise the nature of the ties or interactions to measure to discerning the meaning of those ties.

*Researcher's biases.* Validity is enhanced when a researcher openly admits assumptions, philosophical leanings and potential shortcomings that might background the study (Merriam, 1998). Some of these assumptions and shortcomings are discussed later in the study.

#### *Definitions of Key Terms*

The following terms emerged from the literature review and research as central to understanding this study and its findings.

*Administrative Team,* for the purpose of this study, is defined as those individuals physically located within the district's central office, to include the superintendent, deputy and assistant superintendents, supporting staff (administrative assistants), and building administrators (principals). Membership within the organization was negotiated with and verified by superintendent.

*Capacity* is a measure of an organization's ability to expand itself to fulfill its potential (Wheatley, 1999). It relies on structures that are flexible, adaptive, and enable learning and change rather than constraining them. Capacity is the flip side of the coin of

complexity (Bar-Yam, 2004; Cilliers, 2004). Within constructivist leadership, capacity is defined more specifically (see *Leadership Capacity* below).

*Complexity* is comprised of “intricate sets of non-linear relationships and feedback loops” (Cilliers, 2004, p. 25). This intricacy means that only certain aspects of complex systems can be analyzed at once, which inherently distorts the analysis but also opens up new possibilities for understanding how complex systems work.

*Constructivist Leadership* consists of patterns of reciprocal processes that enable participants in community to construct meaning collaboratively towards achieving shared purpose and collective action (Lambert, 2002).

*Leadership* is a phenomenon of organizational life that “is important for the effectiveness of organizations” (Yukl, 2006, p. 5), but for which there is no consensus definition. Yukl offered a broad definition that sought to account for the divergent views of leadership: “the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives” (p. 8). Within the constructivist framework, leadership is defined more specifically as “reciprocal, purposeful learning in a community” (Lambert, 2003, p. 2).

*Leadership Capacity* is “broad-based, skillful participation in the work of leadership” (Lambert, 2003, p. 4).

*Networks* in simplest terms are “nothing more than a collection of objects connected to each other in some fashion” (Watts, 2003, p. 27). Examples include power grids, networks of friends or business acquaintances, the World Wide Web, and neurons in the brain. According to Watts, networks “represent populations of individual

components that are actually *doing something*” (p. 28). They are also dynamic—evolving and changing with time and their own activity. Thus, they are inherently complex systems (Andriani & Passiante, 2004) and exhibit a form of collective intelligence (Kelly, 2003).

*Senior leadership* comprises a sub-set of the administrative team that was involved in the Phase Three group interview. Sometimes referred to as senior leaders, senior leaders group, or senior leadership, the entity included the superintendent, deputy and assistant superintendents, and building administrators (principals).

*Small world theory* reveals that within networks, individual actors or entities are separated from other actors or entities by only a few steps or degrees, which has implications for the transmission of information or other resources (Barabási, 2002; Watts, 2003). Small worlds are comprised of many clusters of entities, some larger than others, as well as random and non-random connections between and among entities. These aspects mean that even though networks seem chaotic and unpredictable, they behave in surprisingly systematic and self-organizing ways (Barabási, 2002; Watts, 2003).

*Social Network Analysis (SNA)* provides a tool for analyzing social networks. It provides “precise formal definition to aspects of the political, economic, or social structural environment,” which is “expressed as patterns or regularities in relationships among interacting units” (Wasserman & Faust, 1994, p. 3).

### *Summary*

Theories of leadership have oversimplified this critical dimension of organizational life and failed to account for such realities as globalization, information

symmetry, heightened interconnectivity and interdependence, and increased complexity and ambiguity. There remains a bias to viewing organizational behavior through a Newtonian, reductionist worldview (Barabasi, 2002; Papparone, 2008; Wheatley, 1999). Countering this tendency requires more complex conceptions of organizational life and leadership, conceptions that account for more diffused, collaborative, and networked ways of working and making sense of things. This study, framed by multiple and interrelated theories, among them constructivist leadership, leadership capacity, complexity and networks, sought to employ an Information-Age tool—social network analysis—to examine leadership and ways to expand its capacity within the administrative team of a district central office.

Provided in Chapter Two is a review of the relevant literature related to the study. The study's research design and methodology are addressed in Chapter Three. Reported in Chapter Four are analyzes of the results of the investigation, which leads to the study's summary, conclusions, and recommendations for future study in Chapter Five.

## CHAPTER TWO

### REVIEW OF THE LITERATURE

#### *Introduction*

Yukl (2006) asserted that the vast majority of literature on leadership consistently links leadership with a single individual, either he who exhibits these qualities and skills or she who holds a formal position of leadership or authority (as reflected in the clichéd line: “Take me to your leader”). Breaking ranks with this traditional view, an increasing body of literature (Barth, 1990; Bar-Yam, 2004; Donaldson, 2001; Gronn, 2002; Hord, 2004; Lambert, 2002; Ogawa & Bossert, 1995; Shapiro, 2000; Walker, 2002) has called for a broader, more complex and more diffused conceptualization of leadership, one in which leadership is constructed and enacted by all participants within an organization and becomes a quality of the entire organization rather than any single person.

Lambert (2003) made a crucial observation about leadership when she stated, “how we define leadership frames how people will participate in it” (p. 4). In organizations from schools to corporations, a key question emerges related to this insight: who defines leadership? Often, no one does. This is to say that no one gives it explicit expression. Leadership tends to exist as it has always existed, typically reflecting prevailing cultural norms and habits of thinking (Yukl, 2006). Or, just as often, only one person does – the formal leader (Brafman & Beckstrom, 2006). Implicit definitions of leadership can lead to uncertainty, confusion, and even conflict as people operate presumptively about what is expected of them. Explicit definitions of leadership by a single or tightly defined group overly constrict its possibilities and lead to environments characterized by “power over” relationships rather than “power to” relationships

(Brunner & Schumaker, 1998). No matter who defines it, leadership in the Information Age must account for a decidedly more complex world (Bar-Yam, 2004; Martin, 2007; Weick, 2008; Wheatley, 1999; Yukl, 2006).

Schools today face vexing challenges that demand innovative responses. The challenges facing superintendents, principals, teachers, parents, community leaders, and students point to very specific qualities or dimensions of leadership that are necessary to navigate them successfully. Among these qualities are the ability to see the big picture, think complexly, and be open-minded about solutions to problems (Andriani & Passiante, 2004; Bar-Yam, 2004; Cilliers, 2004; Lambert, 2002; Weick, 2006; Yukl, 2006); the ability to work collaboratively to solve the most troublesome of these challenges (Barth, 1990; Bruffee, 2003; Lambert, 2002; Lambert, 2003; Shapiro, 2000); the willingness to encourage and accept multiple or diverse viewpoints and harness this diversity toward a common goal (Cooper, 2002; Lencioni, 2002; Lambert, 2002; Lambert, 2003; Yukl, 2006; Zimmerman, 2002); the commitment to be present and engaged fully (Barth, 1990; Starratt, 2004); the sensitivity to speak with candor and listen with empathy in order to facilitate reciprocal relationships and dialogue (Cooper, 2002; Starratt, 2004; Zimmerman, 2002); the dedication to collegiality (Barth, 1990); and, finally, the habit of being reflective and open to continual learning (Barth, 1990; Lambert, 2002; Preskill & Torres, 1999; Starratt, 2004).

While these dimensions can be contained within and reflected by a single individual, evolving theory reveals that their impact is intensified when they are reciprocally shared throughout the entire organization. In short, leadership becomes a quality or capacity of the entire organization rather than of an individual person (Drath,

2003; Lambert, 2003; Ogawa & Bossert, 1995). Yet, despite the need for envisioning leadership more broadly, the fact remains that formal figures of authority will continue to head organizations. Principals will continue to oversee public elementary and secondary schools; headmasters will oversee private schools; and presidents or chancellors will preside over colleges and universities.

Like many things in tension, the tension between organizationally-diffused leadership and person-centered leadership has both constructive and unconstructive (even destructive) tendencies (Drath, 2003). The literature presents a challenge for school leaders seeking to understand and resolve or leverage this tension because it has tended to focus on one end of the spectrum or the other. Leadership has been explored largely as an either/or proposition: either as a dimension of a single person or as a dimension of the entire organization. While some theories have acknowledged the need for a more balanced approach, few have found an acceptable point of equilibrium or “sweet spot” (Brafman & Beckstrom, 2006, p. 188).

The chief challenge remains how best to discover this sweet spot. Constructivist theory posits that leadership must be generated from the inside out, through capacity-building mechanisms, conversations, and reciprocity (Lambert, 2003). Social network theory goes even further by revealing subterranean nodes of power, information, and influence and their interconnecting links (Cross & Parker, 2004; Krebs, 1996). By making this lattice-like structure more visible and explicit, schools can harness the latent capacity that already exists within their organization and amplify deliberate efforts to build capacity (Cross & Parker, 2004; Krebs, 2000; Stamps & Lipnack, 2008).

This review of literature was undertaken to demonstrate the need for a new conception of school leadership, one fully realized by those who participate in it. First, the author examines the evolution and complexification of thinking about leadership and why this evolution is both natural and essential. This includes an overview of how the employment of frames and metaphors to analyze organizations has widened the aperture of understanding about leadership and leads naturally to the formulation of constructivist theory. Next, the review examines constructivist leadership theory in greater depth, with comparisons made to other contemporary theories in order to strengthen its relevance and singular merits as well as reinforce the broadening consensus that leadership is a capacity of the entire organization. This leads to a discussion of the constructivist concept of leadership capacity and the ways this capacity can be realized. Seen another way, capacity is complexity, the tenets of which are then discussed. Greater capacity/complexity is a product of deliberate actions and mindsets, but it is also a product of informal structures and networks that are often overlooked or underappreciated for their potential to influence capacity. These informal, often implicit, aspects of capacity are made clearer through a review of the literature on network and small world theories. Finally, the author examines the literature on leadership in district central offices.

#### *The Evolution and Complexification of Leadership Theory*

Views of leadership are typically aligned with the way organizations are framed (Bolman & Deal, 2003; Ogawa & Bossert, 1995). Bolman and Deal offered four such frames, which on the one hand are four different vantage points from which to analyze organizations and, on the other, reflect a historical chronology of thinking about

organizations. As thinking about organizations has become more complex, so has thinking about leadership. Table 1 reflects how organizational theory and leadership theory are aligned in their evolution over time. The theories and types of leadership are drawn from articles by Bensimon, Neumann, and Birnbaum (1989) and Leithwood, Jantzi, and Steinbach (2000).

Table 1

*Alignment of Evolved Leadership Theories to Organizational Frames*

Frame	Correspondent Leadership Theory
Structural Frame	<ul style="list-style-type: none"> <li>• Trait theories: traits are innate; great person concept</li> <li>• Behavioral theories: change the environment to alter the behaviors</li> <li>• Transactional leadership</li> <li>• Instructional leadership</li> </ul>
Human Resource Frame	<ul style="list-style-type: none"> <li>• Trait theories: traits of leadership can taught or enhanced</li> <li>• Behavioral theories: change the behaviors to alter the environment</li> <li>• Contingency or situational theories</li> <li>• Participatory or democratic leadership</li> <li>• Transactional and transformational leadership</li> <li>• Servant leadership</li> </ul>

Table 1 (continued)

*Alignment of Evolved Leadership Theories to Organizational Frames*

Frame	Correspondent Leadership Theory
Political Frame	<ul style="list-style-type: none"> <li>• Power and influence theories</li> <li>• Social exchange theories</li> <li>• Contingency or situational theories</li> <li>• Constructivist theories</li> <li>• Transactional leadership</li> <li>• Participatory or democratic leadership</li> <li>• Moral leadership</li> </ul>
Symbolic Frame	<ul style="list-style-type: none"> <li>• Cultural theories</li> <li>• Cognitive theories</li> <li>• Constructivist theories</li> <li>• “The management of meaning”</li> <li>• Transformational leadership</li> <li>• Servant leadership</li> <li>• Moral leadership</li> </ul>

Through time, an iterative process has occurred concerning the framing of organizations and leadership. Not only have organizations become increasingly complex, so too have the conceptions about them. Morgan (1997), whose thoughts on metaphor will be reviewed later in this chapter, employed several metaphors to enhance understanding of organizations, among them the brain. In the past, if organizations were

understood purely in mechanistic or structural ways, then the notion of comparing them to the human brain would have been rejected. Either this or the conception of the human brain was far simpler than it is today. What has made possible the complexification of thinking and acting has been revolutionary advances in science and technology, especially information technology (Andriani & Passiante, 2004; Bar-Yam, 2004). Not only are vastly more complex metaphors and models available today, but the objects about and to which they are applied are more complex because they can be investigated and modeled more complexly (Andriani & Passiante, 2004). It is, therefore, useful to see how this evolution has occurred.

### *Structural frame*

Two of the assumptions undergirding the structural frame are that organizations achieve their missions more efficiently when roles are clarified and specialized (division of labor) and subsequently coordinated and integrated (Bolman & Deal, 2003). The structural frame relies heavily on hierarchy as its organizing and coordinating principle, on top of which presides a single individual. In other words, role specialization includes the creation of a leadership role with responsibilities that cannot be shared without risking the effectiveness of the organization (Yukl, 2006).

An outgrowth of the industrial revolution and a largely patriarchal society (Bolman & Deal, 2003), the structural view was (and remains), in many ways, a means to justify the patriarchy and the patriarch. As a consequence, theories of leadership tended to focus exclusively on the individual or individuals at the top of the pecking order (Yukl, 2006).

Leadership theories tied to this view of organizations tend to reinforce the equation that leadership equals leader. The leader is he around whom the organization revolves, so understanding leadership becomes a case study of the leader himself – his inborn traits, his habits, and his behaviors (Yukl, 2006). Among these behaviors is the ability to orchestrate the efforts of subordinates at all levels, either through quid-pro-quo transactions or by modeling the way (imitation). According to Yukl, the challenge with this view of both organization and leadership is that it overly simplifies the complex dynamics that are involved, such as intervening variables, external factors, the dynamics of power, and situational variables, among others.

#### *Human resource frame*

If the structural frame focuses on the skeleton of an organization, the human resource frame looks at its organs—the living, breathing apparatus that gives an organization its unique life. According to Bolman and Deal (2003), “organizations exist to serve human needs rather than the reverse.” The human resource frame begins to broaden leadership possibilities away from mechanical, managerial, or transactional routines and relationships to situational and transformational ones, although the locus of leadership still remains the exclusive province of the formal leader.

Within the human resource frame, leadership tends to emerge as a function of how the people within an organization are viewed or “framed” from the perspective of the formal leader (Bolman & Deal, 2003). McGregor’s Theory X/Theory Y offers a case in point. Theory X assumes that people are inherently lazy, lack ambition and want or need to be led. Theory Y assumes much the opposite—that people are self-directed, ambitious and need more guidance than directed management (McGregor, 1960). If a

leader operates from a Theory X perspective, then he or she is more likely to lead in a directed way, using tight controls and/or coercion. If he or she operates from a Theory Y perspective, then his or her chief task is to “arrange organizational conditions so that people can achieve their own goals best by directing their efforts toward organizational rewards” (McGregor, 1960, p. 61).

Other theories of leadership arising from this frame are essentially variations on the theme that the way leaders view subordinates dictates how they will lead them. Theory X supports more transactional leadership, while Theory Y paves the way for servant and transformational leadership, among others. Situational or contingent leadership essentially argues that leaders must adapt their leadership to fit both the person being led and the specific situation in which leadership is being enacted (Leithwood, Jantzi, & Steinbach, 2000). Finally, as leaders evolve their viewpoints about others in their organizations (along the Y rather than the X axis), seeing them less as subordinates and more as peers (as Lencioni, 2002, prescribes), more complex conceptualizations of leadership emerge from this frame, among them participative, democratic, and invitational.

### *Political frame*

The structural frame looked at the skeleton of an organization or its physical infrastructure. The human resource frame looked at the people inside. The political frame adds the dynamic of broader human interaction and explores facets of organizations that emerge from these interactions. Rather than being a mere collective of discrete living beings, the organization itself teems with life and begins to take on attributes of a living organism. The assumptions supporting this frame are that organizations are “complex

webs of individual and group interests” (Bolman & Deal, 2003, p. 188). As soon as there are two people in a room, difference exists and competition begins. Leadership becomes a matter of navigating these differences and allocating scarce resources (Bolman & Deal). The progression from frame to frame clearly increases the complexity of how one views both organization and leadership.

The political frame concerns issues of power, mediation, and agenda setting (Bolman & Deal, 2003). Leadership within this frame involves understanding the dynamics of power and how to achieve, maintain, and engage it. It further involves an understanding of coalition building and consensus building. As these authors make clear, within the political frame, the potential for turning legitimate authority on its head becomes very real. The rigid and clear rules of engagement within the structural frame become problematic, and those on the bottom can wield as much if not more power than those at the top. Given this fact, leadership becomes less a function of the qualities of the formal leader or his views of subordinates and more a function of the dynamic between them.

### *Symbolic frame*

Enlarging the dynamic that exists between and among people within an organization—what Lambert (2002) defines as its “spaces, fields or zones” (p. 43)—becomes the domain of the symbolic frame. These fields and zones act to channel the animating force of an organization, expressed in terms of its culture, history, traditions, ceremonies, rituals, symbols, and metaphors (Bolman & Deal, 2003). This frame widens to an even greater extent the possibilities for leadership because it begins to recognize that leadership “like energy, is not finite, not restricted by formal authority and power; it

permeates a healthy culture and is undertaken by whoever sees a need or an opportunity” (Lambert, 2002, p. 43).

A key assumption governing the symbolic frame is that ambiguity and uncertainty are more widespread within organizations than we might imagine or recognize and that people employ symbols and metaphor to “resolve confusion, increase predictability, find direction, and anchor hope and faith” (Bolman & Deal, 2003, p. 242). Within this frame, then, leadership becomes largely an act of sensemaking, and, while it is possible for the formal authority to attempt to make sense of things on behalf of the entire organization, the literature on the construction of meaning (which is essentially a process of learning) concludes that sensemaking is a collaborative process in which everyone has a role, both leader and follower, teacher and learner (Barth, 1990; Bruffee, 1999; Bolman & Deal, 2003; Drath, 2003; Lambert, 2002; Nonaka & Tagueuchi, 1995; Weick, 2008). In fact, in this frame, the line between leader and follower melts away, first by viewing everyone as having similar traits and possibilities, as being simultaneously leader and follower and, second, by viewing leadership as a dimension or quality of the entire organization rather than any single individual within it (Ogawa & Bossert, 1995; Lambert, 2002, 2003).

#### *Four phases of administrative thinking*

Shapiro (2000) summarized four phases of administrative thinking first postulated by Roald Campbell that somewhat parallel Bolman and Deal’s (2003) four frames. These phases include scientific or industrial management, human relations, structuralism and open systems. Like Bolman and Deal’s four frames, these phases evolve organizations from being rigid and inflexible systems to open and dynamic ones. Leadership evolves from being largely authoritarian to being distributed and interdependent.

### *Frames versus images and metaphors*

Bolman and Deal (2003) provided four frames through which to view, analyze, and understand organizational behavior. In contrast, Morgan (1997) offered a schema that leverages metaphor to understand organizations. Morgan's metaphors are inherently more complex, which is the nature of metaphor. "Metaphor encourages us to think and act in new ways. It extends horizons of insight and creates new possibilities" (p. 351). Thus, it allows for a more expanded and complex conceptualizations of leadership from the outset. Morgan expounded on eight metaphors in his *Images of Organization* but made clear that many more metaphors are possible. Each metaphor only captures one facet of an organization to any significant degree. "Metaphors create insight. But they also distort. They have strengths. But they also have limitations" (p. 348). Leaders interested in understanding their organizations better are encouraged by Morgan to examine them through as many metaphors as possible, the act of which speaks to the notion that knowledge, even self-knowledge, is both constructed and iterative.

In his postscript, Morgan (1997) spoke about managers and leaders employing metaphors as a tool to re-envision their organizations to meet new challenges and demands. He stated that "we organize as we imaginize" (p. 377), but by "we" he meant managers, rather than the organization collectively. So, even as he opened the door to new possibilities of viewing and understanding organizations, he seems stuck in structural understanding of leadership, an irony he admitted as one of the shortcomings of metaphors.

Morgan (1997) came closest to the notion of the collaborative use of metaphor for sense-making when he said that "managers at all levels must gain comfort in dealing with

the insights and implications of diverse perspectives” (p. 377). He therefore suggested that not only must the lenses of analysis be diverse, but the eyes through which they are employed must also be diverse. Sensemaking through metaphor is ongoing and fluid, and thus conceptions of organizational life and leadership are also in constant flux. If there is “no single theory or metaphor that gives an all-purpose point of view” (p. 348), either for organizations or leadership, then efforts to define leadership as transactional, transformational, invitational, charismatic, or otherwise become pointless. Morgan essentially argued that leadership is all of these; each is merely a metaphor or lens through which to understand the more complex whole.

*Frames, metaphors and sensemaking: An integrated heuristic*

Paparone (2008) provided a heuristic that effectively synthesizes the various constructs discussed so far. In his article, “On Metaphors We Are Led By,” he investigated how metaphor “shapes understanding in an increasingly ambiguous world of meaning. Indeed the rhetorical work of...those I call ‘thought leaders’...is largely the management of meaning” (p. 55). His target audience was these thought leaders, still prone to logical positivism, and his framework sought to offer a means to avoid the pitfalls of unreflective practice and ensure the imaginative use of metaphor:

The mindless tyranny of defunct metaphors in Western military knowledge has already proven its liabilities. Mindfulness of the inherent potential for such domination can serve to motivate imaginative ways to explore breakthrough sensemakings. Such reflection could lead to inventions of breathtakingly rich eloquence in postmodern military discourse. (p. 64)

Wheatly (1999) would add that not just the military suffers from old-world thinking. She concluded that “each of us lives and works in organizations designed from Newtonian images of the universe” (p. 7). Rather than be content with comfortable ways of knowing or capitulate into the despair of not knowing, she added that leaders must “embrace our despair as a step on the road to wisdom, encouraging us to sit in the unfamiliar seat of not knowing and open ourselves to radically new ideas” (p. 6). In doing so, leaders allow themselves the possibility of achieving truly “elegant” breakthroughs (p. 5).

Paparone’s (2008) heuristic categorizes metaphors by the worldviews out of which they arise. These categories fall into four quadrants defined by two continua: objective-subjective and simple-complicated. Bolman and Deal’s (2003) four frames are overlaid onto this construct, as seen in Figure 1. While not exactly correspondent, the correlation between them demonstrates the degree to which thinking about organizations, leadership, and meaning-making is convergent and congruous.



Figure 1. Paparone's (2008) sensemaking heuristic overlaid with Bolman & Deal's (2003) four organizational frames.

From "On Metaphors We Are Led By," by C. R. Paparone, 2008, *Military Review*, 88(6), pp. 55-64.

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Paparone (2008) stated that within the complicated-subjective quadrant "thought leaders feed on metaphors from the other three views of reality while they attempt to impose their view of reality...their sensemaking, on others" (p. 61). Constructivist thought would modify Paparone's belief that sensemaking (what he also referred to as sensegiving) resides solely within the mind and actions of thought leaders who indoctrinate others with their synthetic sense of things. Rather, in a complicated-subjective world, constructivism advocates for a more diffused and pluralistic process of sensemaking. Again, the trick is finding appropriate balance between singular "narrative constructions" (Paparone, p. 55) and plural ones.

*Leadership through the metaphors of new science and chaos*

Ogawa and Bossert (1995) concluded that how leadership is conceptualized depends on how organizations are conceptualized. Bolman and Deal (2003) and Morgan (1997) asserted that organizations are highly complex and challenging to lead. Therefore, leaders must think complexly and frame or imagine their organizations through multiple perspectives, and iterate to the truth through a process of examining their organizations through multiple frames or metaphors. Yet, these authors suggested that the object of scrutiny—the organization—essentially remains the same throughout. It might be squeezed, pruned, or stretched but it remains the same object of inquiry. Wheatley (1999) argued that metaphors from the realm of new science help us to view organizations in radically new ways. Not only must leaders (individual and collective) examine organizations from multiple perspectives, they need to revision completely the “thing” they are looking at. In so doing, they may radically alter who they are and what they do.

I believe that we have only just begun the process of discovering and inventing the new organizational forms that will inhabit the twenty-first century. To be responsible inventors and discoverers, we need the courage to let go of the old world, to relinquish most of what we have cherished, to abandon our interpretations about what does and doesn't work. We must learn to see the world anew. (p. 7)

According to Wheatley (1999), these new organizational forms will transform leadership into something simpler because, as the new science reveals, beneath the seeming chaos are answers to our most perplexing and vexing problems. “This is a world where order and change, autonomy and control were not the great opposites that we had

thought them to be. It was a world where change and constant creation were ways of sustaining order and capacity” (p. 4). In such a world, Wheatley argued, leadership becomes more diffused, holistic, relational, open, organic, and fluid.

Weick (2008) made a similar argument when analyzing how organizations and leaders can better confront the inexplicable or unfathomable. He, too, calls ultimately for a simpler way:

On the far side of complexity lies profound simplicity. These simplicities may sound a lot like the near-sided superficial simplicities that you and others started with. But that apparent similarity is deceiving. Profound simplicities mean something very different. They are seasoned simplicities, simplicities that have been tested by mentally simulating their consequences, simplicities that reaffirm what it means to be a human being. (¶ 5)

Weick, like Wheatley, paves the way for a more diffused form of leadership, one that begins with the formal leader acknowledging that he or she cannot go it alone. He advocates that leaders move from the superficial to the profound in a public way. “Public sensemaking demonstrates that the struggle for sense is a shared struggle, that there are no experts and that there are no easy answers” (p. 1).

#### *Learning and leading: A framework*

While much of the literature under review ties leadership theory to organizational theory, a parallel relationship also exists between leadership theory and learning theory, especially within the educational domain. Like organizational and leadership theories, learning theory has evolved from a Newtonian worldview to a sensemaking one

(Papparone, 2008; Walker, 2002). Walker (pp. 11-14) provided a framework of learning and leading that included these tandem components:

*Traditional – Traditional.* The traditional view of learning argues that students are empty vessels to be filled by the all-knowing teacher. Knowledge is objective and unchanging and exists external to the learner. Traditional leading is autocratic and top-down, influenced by scientific management theory.

*Behavioral – Behavioral.* The behavioral view of learning posits that learning occurs when knowledge is broken down into manageable pieces and students are rewarded for retention of knowledge. “The aim in the classroom is to calibrate behavior to achieve set learning objectives and goals” (Walker, 2002, p. 11). Behavioral leading calls for educational leaders to modify student behavior so as to achieve organizational aims. Principals reward expected teacher behavior; teachers reward expected student behavior. The process is transactional.

*Grouping/Tracking – Contingency/Situational.* This view of learning categorizes learners into groups based on ability or level of maturity. The goal is to move students to the next level of achievement, although Walker (2002) argues that placement tends to remain fixed. Leadership is situational because it must adapt to the specific level of the subordinate or student. Administratively, principals employ teacher supervision to move them to the next level of performance. Leaders are mostly directive with subordinates.

*Learning/School effectiveness – Instructional leadership/Trait theory.* “Students learn when the curricular goals are clearly delineated and when teaching and assessment methods are aligned with the curriculum” (Walker, 2002, p. 12). Instructional leadership calls for the principal to define curricular goals and model proper and effective teaching.

*Community of learners – Community of leaders.* Within a community of learners, learning is collaborative and cooperative. The process of learning is as important as the content of learning. Teachers become less didactic and more facilitative, and principals and teachers become co-collaborators with a learning community. Leadership becomes a shared process. The principal becomes a leader of learners and a leader of leaders, and organizational structures are flattened. Democratic processes are emphasized (p. 13).

*Constructivist learning – Constructivist leading.* Constructivist learning encourages students to construct meaning from personal values, beliefs, and experiences. “The development of a personal schema and the ability to reflect upon one’s experiences are key theoretical principals” (Walker, 2002, 14). Rather than external to the learner, knowledge exists within the learner. Learning is social and multiple outcomes are encouraged. Constructivist leading is a reciprocal process among all adults within the school community. “The school functions as a community that is self-motivating and that views the growth of its members as fundamental” (p. 14). Problem-solving and decision-making involve everyone through a process of shared inquiry.

#### *Constructivist Leadership*

As thinking about organizations has evolved through time and become more complex and nuanced, so too has thinking about leadership. Leadership has evolved from being the singular province of the head of the organization to being a more distributed quality of the entire organization. Among the various theories that advance the notion of diffused, organic leadership—and one that holds the promise of radically re-visioning the concept of leadership and the organization from which it arises—constructivist leadership lays out a comprehensive and cogent approach (Greene, 2002).

### *Theoretical roots*

Constructivist leadership emerged largely within the educational domain because it is an outgrowth of theories of learning (Walker, 2002). To understand constructivist thought, it is necessary to examine these theories of learning through constructivism's own historical lens.

According to Walker (2002), although John Dewey never used the term constructivism, he is considered its first proponent. He articulated a view of learning in which learners make sense of new knowledge collaboratively, based on their experiences, both individual and collective. "He believed that the development of the self into a self-directing, inquiring, and reasoning human being was central to education" (p. 29). Dewey was also an advocate for shared decision-making and increasing the power of teachers in deciding the fate of their classrooms.

Following Dewey, the most influential theorist contributing to constructivist thought was Jean Piaget (Walker, 2002). Piaget argued that knowledge was not objective or static. It wasn't a thing but a process. This process involved the continual construction and reorganization of knowledge by the learner, who stood at the center of the process. Learning was a process of moving from concrete to abstract by reconciling what one already knew with new experiences. "As learners mature, they develop new cognitive structures, or schemas, that are more sophisticated, allowing them to make sense of increasingly more complex knowledge" (Walker, p. 29).

Other theorists influencing constructivist thinking include Bruner, Vygotsky, and Feuerstein. Bruner enhanced Piaget's thoughts on cognitive development (Walker, 2002); Vygotsky, whose "zone of proximate development" presaged Bruffee's (1999) "boundary

discourse” with the notion that meaning is negotiated within a field existing between learners and teachers to create knowledge, also stressed the influence of historical and cultural contexts in the learning process. Feuerstein, working with children who had been in concentration camps and whose experience had created cognitive gaps, developed a process of iterative and meditative teaching in which students could “‘self-modify’ or self-construct themselves as learners” (Walker, 2002, p. 31).

### *Current tenets*

Constructivism is both a theory of knowing and coming to know (Walker, 2002). Learners encounter new experiences or knowledge, which are either assimilated into existing cognitive structures or these structures are adapted to accommodate the new experiences. Growth and development occur through adaptation to “disequilibrium” that occurs between what learners believe to be true and what now presents itself as new and different (Walker, 2002). The process of coming to knowledge is influenced by reflection, mediation and social interactions and is dependent upon cultural, historical, and social contexts. Constructivist leadership argues that the process of “coming to know” is not simply the domain of the student but also of the adults within the school community (Lambert, 2002). Everyone is continually and reciprocally involved in growing and developing.

Provided in Table 2 is a set of descriptive phrases that summarize the major tenets of constructivist thought (Walker, 2002, pp. 26-28) and an explanation of each.

Table 2

*Tenets of Constructivist Leadership Theory and Descriptors of Each*

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Tenet	Description
Knowledge and beliefs are formed within the learner	Learners are not empty vessels. They come with experiences and knowledge that are adapted or reframed in light of new experiences and knowledge.
Learners personally imbue experience with meaning	Rather than being told what something means, learners themselves suggest meaning.  Interpretation is colored by a student's prior experience and personal schemas.
Learning activities should cause learners to gain access to their experiences, knowledge, and beliefs	"Questions posed to students must prompt their writing to connect with what they know and believe....When these connections are made, learners draw on what they know and reshape it in new and newly meaningful ways" (p. 26).

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Table 2 (continued)

*Tenets of Constructivist Leadership Theory and Descriptors of Each*

Descriptor	Description
Culture, race, and economic status affect student learning individually and collectively	These are the “hidden curriculum” of schools (p. 27). Students must come to understand how culture, race and status affect them and their path to knowledge.
Learners play a critical role in assessing their own learning	Learning is enhanced through “authentic assessment” (p. 28) in which students help to determine how much they have learned.
The outcomes of the learning process are varied and often unpredictable	Because learning involves helping students along the path to knowing, it also involves giving up some control to allow students to arrive at new destinations using their unique perspectives and interpretations.

Given this foundation of thinking about learning, Lambert (2002) argued that leadership cannot help but be reconceptualized. If organizations of learning are about cultivating learning for everyone, both child and adult, and if this cultivation is collaborative, highly social and yet simultaneously more self-directed, then leadership must be rooted in significantly different assumptions about what is involved and how it is

achieved. Yukl (2006) and Leithwood, Jantzi, and Steinbach (2000) argued that most theories of leadership involve questions of influence: who exerts it, how is it exerted, and to what outcomes. In most every theory, influence is viewed as a dynamic between one person or a small group at the top and the rest of the organization. Lambert (2002) argued that within organizations guided by constructivist theories of learning, the dynamic of influence is, and must be, more democratic and reciprocal. She stated, “The function of leadership must be to engage people in the processes that create the conditions for learning and form common ground about teaching and learning” (p. 35). This common ground cannot be achieved under a conception of leadership and influence in which only one person or small group dictates how learning should or will occur. Just as constructivist theory necessitates a letting go on the part of teachers and an empowering of students to be more involved in their learning, so too does the theory call for a letting go of power and control of influence and an empowering of all members of an organization to determine their destiny.

Lambert (2002) summarized the essence of constructivist leadership by citing its core principles: constructivist leadership is:

Beyond person and role and embedded in the patterns of relationships we will refer to as “reciprocal processes.” These patterns enable participants in a community to construct meaning and knowledge together. We hold deep faith that, when individuals learn together in community, shared purpose and collective action emerges—shared purpose and action about what really matters. (p. 42)

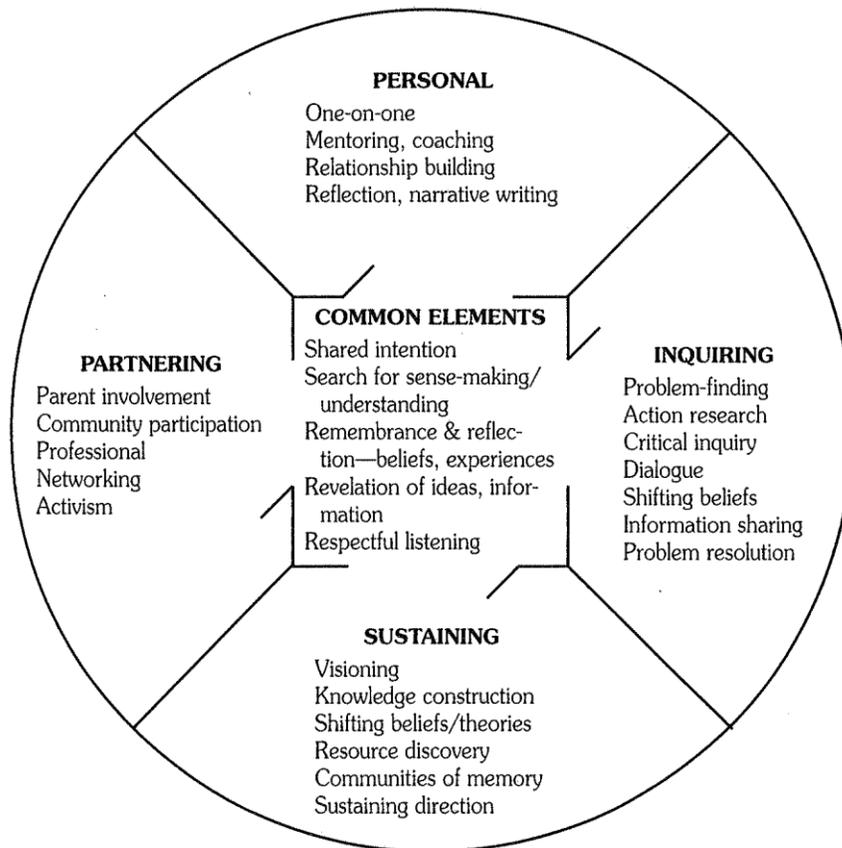
*Conversations: the heart of constructivist leadership*

Lambert (2002) posited that shared meaning, purpose and action arise from conversations. “The conversations serve as the medium for the reciprocal processes that enable participants in a school community to construct meanings toward a shared purpose about teaching and learning. Conversations are fractals of communities; that is, they recreate on a smaller scale the ecological processes of the larger community” (p. 63). As will be mentioned in the discussion about complexity, fractals are characteristic of complex systems (Bar-Yam, 2004; Wheatley, 1998).

It is because life is complex that conversations become all the more necessary. Thus, according to constructivist thought, “a primary role of the constructivist leader is to lead the conversations. In so doing, a leader opens, rather than occupies, space” (Lambert, 2002, p. 64). By conversations, Lambert means all forms of dialogue, even monologue (conversations with oneself through reflective acts). She cautions that not all talk constitutes conversation, which is intended to be reciprocal. Conversations are agenda-free, “power-to” rather than “power-over” (Brunner & Schumaker, 1998), and strive after truth. In short, constructivist conversations “are characterized by *shared intention* of genuine ‘truth-seeking,’ *remembrances and reflections* of the past, a *search for meaning* in the present, a *mutual revelation of ideas and information*, and *respectful listening*” (Lambert, 2002, p. 65).

Lambert (2002) provided both a typology of conversations that offer different portals or entry points designed to foster collaborative sensemaking and shared purpose and a list of acts that facilitate each type of conversation (Fig. 2). Each quadrant of the typology is open and dynamic, overlapping with the other types of conversations. When

it comes to leading conversations, everyone in the community has a role and must be actively involved, although initially it may require a jump-start from the formal leader or leadership team.



*Figure 2.* Lambert’s (2002) typology of constructivist conversations

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From “Leading the conversations.” In Lambert, L., Walker, D., Zimmerman, D. P., Cooper, J. E., Lambert, M. D., Gardner, M. E. et al. *The Constructivist Leader*, 2<sup>nd</sup> ed. (pp.34-62). New York: Teachers College Press. Reprinted with written permission of the author.

Zimmerman (2002) amplified this typology of conversations by suggesting that leaders can employ a set of linguistic tools or moves to facilitate reciprocity and sensemaking. “The constructivist leader’s goal is to explore meaning with others as a way

of deepening understanding, producing clarity, or reframing thinking. By using linguistic moves and being conscious of language choices, a leader creates spirals of meaning that are continuously formed and reformed” (p. 89). Zimmerman stated that conversations, like other complex systems, are unstable. They continually reshape themselves and move through spirals of complexity and simplicity. At their core, “reciprocal linguistic moves are a powerful way to manage the unknowable; by applying them, the leader creates a holding environment for the emerging conceptual thinking that deepens and sometimes shifts to new understandings” (p. 91).

Zimmerman (2002) outlined three enabling structures for collaborative discourse and three linguistic moves designed to optimize the power of conversations. The enabling structures are initiating, constructing, and closing activities. Initiating activities get participants engaged and focused and bridges them from personal to group work. They help to build “patterns of relationships that are respectful of one another and of the group” (p. 95). Constructing activities get at the essential work of leadership: “The most important leadership act is framing issues and constructing opportunities for focused conversation about these issues” (p. 95). Doing this work well means dealing with complexity and ambiguity and trusting that “out of chaotic and sometimes confusing conversations can come complex understandings” (p. 95). Closing activities reflect back on what the group has accomplished and “create communities of memory and commitment” (p. 96).

The linguistic moves include the question, the paraphrase, and the reflective pause. Asking questions may seem simple but Zimmerman (2002) contended that there is an art to asking both rhetorical and categorical questions that must be learned and refined.

“How leaders learn to frame questions either limits or enhances the group’s ability to construct meaning and act in concert with others” (p.98). Paraphrasing is more than mere restatement. In summarizing what someone has said, it provides selective focus but also direction. “From a constructivist viewpoint we would define paraphrase as the way we communicate understanding through speaking or writing. We also assert that the paraphrase points the way in conversation and that it can shift a group’s focus beyond their current thinking” (p. 101). Pausing reflectively allows for what Zimmerman termed “breath-taking” moments (p. 104) in which members of the group can think and metathink. These pauses need not be forced or artificial. Zimmerman argued that they are inherent in the cadence of conversation; they just need to be paid attention to.

Ultimately, conversations are about the creation of unifying and evolving narratives (Cooper, 2002) that connect people across differences and give them the ability to construct shared meaning and vision. Weick (2008), Paparone (2008), and Postman (1997) each reinforced the importance of the *evolving* nature of narrative. The moment leaders think they have things figured out or the story finished is the moment they delude themselves and stop short of what needs to be accomplished. In a complex, networked and highly diverse age, Postman argued that we need to “enlarge” our narratives to encompass multiple truths and, in so doing, continuously grow and change.

#### *Related Theories*

To summarize to this point, constructivist leadership arises out of theories of learning and coming to knowledge. These theories imbue (or construct) leadership with a number of characteristics that prove similar to other theories of leadership, among them distributed, transformational, servant, invitational, and professional learning

communities. Yukl (2006) has argued that the study of leadership is often governed by the *theory du jour* or the belief that one theory offers the preeminent conception of leadership. He has countered that leadership is more accurately an amalgam of many theories. Put another way, understanding related theories helps to enlarge the possibilities available for constructivist leaders to contemplate and incorporate into their conversations and narratives.

Constructivist leadership flattens out organizations by focusing on reciprocal relationships across the entire organization. The diffusion of leadership across the whole organization echoes Gronn's (2002) definition of distributed leadership as "influence attributed voluntarily by organizational members to one or the other of these focal units" (p. 428). The focal units to which Gronn is referring range from a single individual, to collectives of separate people, to teams, to larger organizational units. Gronn's conception of leadership arises from social science and examines leadership more as a calculus of influence rather than as an organic process that arises from a commitment to collaborative sensemaking and learning.

As already pointed out, constructivist leadership calls for formal leaders to let go of centralized power and employ strategies that enhance reciprocal processes. This letting go is akin to the central premise of servant leadership, which challenges leaders to empower their subordinates and encourage them to assume a greater responsibility for their destinies (Greenleaf, 1977; Yukl, 2006). Like constructivist leadership, servant leadership requires that those in authority become more active listeners and learners, eager to understand the needs of their organization and people and then serve those needs.

There are also strong similarities between constructivist and transformational leadership. Burns (1978) stated that “leadership is the reciprocal process of mobilizing, by persons with certain motives and values, various economic, political, and other resources, in a context of competition and conflict, in order to realize goals independently or mutually held by both leaders and followers” (p. 425). The difference, however, is that transformational leadership “situates responsibility for the growth of others in the designated leader” (Lambert, 2002, p. 39). Both theories rely on reciprocal processes, but constructivism expands the number of these processes to the point where transformative acts become the responsibility of everyone, not just the formal leader. Interestingly, Burns (1978) equates transformative leaders with leaders who teach. Lambert (2002) would suggest that transformative leaders are instead—or also—those who learn.

Invitational leadership might be viewed as an opening gambit toward achieving a constructivist endstate. Like transformational leadership, invitational leadership continues to situate responsibility for transformative acts in the person of the designated leader, but invitational leadership more actively seeks to share leadership with others in the organization by inviting them to join the collective effort, one that embraces “doing-with” rather than “doing-to” relationships (Kovak, 2005, p. 46). Like constructivist leadership, invitational leadership is about enhancing personal and professional relationships to solve problems collectively. Both theories emphasize the importance of messages and language. According to Kovak, invitational leadership is so named because it relies intensely on overt invitations, which are “defined as the summary of the content of messages communicated verbally, non-verbally, formally and informally through people, places, policies, programmes and processes. These inviting messages tell people

that they are valuable, able and responsible, and can behave accordingly” (p. 46).

Invitational leadership requires an environment of trust, care, optimism, and intentionality, all harnessed by and through the inviting act of the formal leader.

Among the various complementary theories, the one that most resembles constructivist theory is that of professional learning communities. Both are rooted in the notion that organizations that learn together are also better able to lead together (Hord, 2004; Lambert, 2002). The act of learning collaboratively breaks down barriers and rigid structures, allowing individual strengths to emerge that enable everyone to contribute as both follower and leader. Professional learning communities are predicated on supportive and shared leadership, shared values and vision, collaborative learning, supportive conditions and shared practice, as is constructivist leadership (Hord, 2004). The main difference between the two theories is essentially the degree to which the formal leader sanctions professional learning communities within his or her organization and participates within them as an active contributor. Professional learning community theory operates on the premise that reciprocal processes must be sanctioned by the formal leader. In constructivist theory, such sanctioning is less necessary; the organization as a whole assumes from the outset that it is a community of learners committed to collaborative sensemaking and problem solving (Lambert, 2002; Walker, 2002).

#### *Leadership Capacity*

Wheatley (1999) argued that leadership cannot be defined in absolute terms but hovers in the vast middle: “This is a world where order and change, autonomy and control were not the great opposites that we had thought them to be. It was a world where change and constant creation were ways of sustaining order and capacity” (p. 4).

Lambert (2003) described leadership capacity as “broad-based, skillful participation in the work of leadership” (p. 4). She articulated six features of leadership capacity within school communities: (a) Principals, teachers, parents, and students as skillful leaders, (b) Shared vision resulting in program coherence, (c) Inquiry-based use of information to inform decisions and practice, (d) Broad involvement, collaboration, and collective responsibility reflected in roles and actions, (e) Reflective practice that leads consistently to innovation, and (f) High or steadily improving student achievement (pp. 6-7).

For Lambert (2003), capacity is both a measure of diffusion and skillful involvement in leadership. “Breadth of participation alone does not result in high leadership capacity; skillful involvement is needed as well....Collaboration without skill is unsatisfying and will inevitably be abandoned for unilateral and thus more efficient ways of working” (Lambert, p. 4). Breadth of involvement and depth of skillfulness become two dimensions that create four possible capacity scenarios: low participation, low skill; high participation, low skill; low participation, high skill; high participation, high skill. The goal of constructivist organizations is to evolve to the high-participation, high-skill quadrant, thus maximizing leadership capacity.

Achieving this goal involves what Lambert (2003) terms patterns of participation, the most powerful of which are inquiry-based, and which emerge from teams, whether leadership teams, research teams, or vision teams. Goal attainment also depends on professional development that fosters the skills necessary for strong reciprocal relationships, including listening, reflection, inquiry, and capacity-building dialogue and language. For Lambert, teachers as leaders form the heart of high-capacity schools, which

requires that leaders evolve from either directive or laissez-faire ones into collaborative and capacity-building ones.

While teachers as leaders is central to leadership capacity, Lambert (2003) argued that principals and superintendents still have a critical function to play; in fact, their role is more important than ever if capacity is to flourish within schools. As learners-in-chief, they “model learning for others, presuppose that questions are open for exploration, and [become] increasingly effective in the work of building leadership capacity” (pp. 49-50). These leaders, perhaps more than any other, hold on “tightly to hope” and “create organizational climates of trust, information sharing, healthy risk-taking, and learning” (p. 44).

### *Complexity*

Organizations are networks of people (Krebs, 1996). In the Information Age, networks are inherently complex but they also offer elegant solutions to their complex environments (Andriani & Passiante, 2004). In answer to the question, “Why complexity?” Andriani and Passiante answered that contemporary society is “characterized by increasing diffusion and availability of information across networks. Consequently, decision-making becomes more decentralized resulting in integrated systems disintegrating into networks of autonomous units” (p. 5). The upshot of this disintegration is increased diversity, brought about by the democratization of information access (or, conversely, the erosion of information asymmetry created in a hierarchal organization), a decrease in certainty, and an increase in innovation rates. These forces chafe at organizational structures that strive after classifications and regimentation and demand a more flexible, albeit seemingly chaotic, alternative.

Cilliers (2004, pp. 23-24) provided a taxonomy of complex systems that includes the following:

1. Complex systems consist of a large number of elements, which interact and change with time.
2. The interactions are rich, meaning that any element within the system influences or is influenced by other elements.
3. The interactions have unique characteristics, such as non-linearity, which means that small causes can have large results and vice versa.
4. The interactions occur over a short range, that is, information is received mostly from immediate neighbors but because interactions are rich, wide-ranging influence is possible.
5. There are loops of interactions in which actions often feed back on themselves, both positively and negatively; both are required within complex systems.
6. Complex systems are typically open systems and operate under conditions of disequilibrium. "Equilibrium is another word for death" (p. 24).
7. They have histories. They evolve through time and their present is predicated on their past.
8. Each element of the system operates autonomously and is "ignorant of the behavior of the system as a whole" (p. 24). These elements act on information available to them locally.

Cilliers concluded: "Complexity is the result of a rich interaction of simple elements that only respond to the limited information each of them are presented with. When we look

at the behaviour of a complex system as a whole, our focus shifts from the individual element in the system to the complex structure of the system” (p. 24).

Ba-Yam (2004) noted that a hierarchical organization can be complex but only as complex as the person in charge. In an ambiguous and indeterminate world, the capacity of one individual becomes insufficient to deal with the challenges confronting human collectives. “Complex challenges make it virtually impossible for an individual leader to accomplish the work of leadership, and individual leadership therefore reaches a distinct limit in the face of complex challenges” (Drath, 2003, p. 5).

The law of requisite variety posits that a complex environment demands a complex organism, which is comprised of not just a single brain but many brains (Andriani & Passiante, 2004; Bar-Yam, 2004, Kelly, 2003; McKelvey, 2004; Morgan, 1997), what McKelvey (2004) terms “distributed intelligence” (p. 41) and Kelly terms “hive mind” (Chap. 2, *Asymmetrical invisible hands*, ¶ 6). The value of complexity theory is that it provides a means to discover order within highly diffuse and diverse organizations. “Complexity describes how, under a set of context-dependent conditions, a set of heterogeneous agents, in their quest for individual fitness, achieve a level of order at the aggregate level, in short, how they self-organise around emerging order” (Andriani & Passiante, p. 8).

This concept of self-organization is echoed by Barabási (2002), who posited that complexity emerges from a counter-reductionist worldview that has been “the driving force behind much of the twentieth century’s scientific research” (p. 6). This worldview argued that the whole could be understood by understanding the constituent parts but, as Barabási pointed out, this is like trying to understand complex human behavior by

understanding individual genes. The truth is that while the constituent parts are well understood, the whole is not and complexity is the reason why:

We have learned that nature is not a well-designed puzzle with only one way to put it back together. In complex systems the components can fit in so many different ways that it would take billions of years for us to try them all. Yet nature assembles the pieces with a grace and precision honed over millions of years. It does so by exploiting the all-encompassing laws of self-organization, whose roots are still largely a mystery to us. (p. 6)

Barabási went on to assert that “complexity has a strict architecture” (p. 7), of which the network is its most fundamental manifestation.

### *Networks*

The language of capacity employs terms such as reciprocal relationships, rich organizational patterns, and interlocking patterns (Lambert, 2003). Andriani and Passiante (2004) employed the metaphors of “open source” and “webs of conversations” (p. 12) to describe contemporary organizations. Kelly (2003) used terms such as parallel systems, swarm systems, and hive minds. McKelvey (2004) spoke of distributed intelligence, amplifying Morgan’s (1997) emblematic use of the human brain to characterize organizational life. At the core of each of these conceptions of human interactions is the network, which in simplest terms is a map of nodes and the connections that might or might not exist among them (Barabási, 2002; Cross & Parker, 2004; Krebs, 1996; Wasserman & Faust, 1994; Watts, 2003). Kelly (2003) argued that the network offers an elastic topology that is the least-structured structure possible to deal with the diversity inherent in organizations.

Network theory is not new. According to Watts (2003), it dates back to the work of the mathematician, Leonhard Euler, in the early 1700s, who sought to answer the question of whether it was possible to cross seven bridges in his hometown without crossing the same bridge twice. He did so by creating node and line diagrams called graphs. Graph theory has since found application in a wide range of fields from sociology to physics to economics. However, until recently, the study of networks has tended to be fragmented among these fields of study, each of which has viewed them purely as structures, locked in time and space, assumptions that Watts contended were inaccurate.

Networks are not purely static structures comprised of discrete components; they are at work, whether creating power within power grids or decisions within human social structures (Watts, 2003). “Although the structure of the relationships between a network’s components is interesting, it is *important* principally because it affects either their individual behavior or the behavior of the system as a whole” (p. 29). Secondly, networks are dynamic because not only are things occurring within them but they are evolving over time, which ties back to the tenet of complex systems that they have histories (Cilliers, 2004; Watts, 2003).

In the connected age, therefore, what happens and how it happens depend on the network. And the network in turn depends on what has happened previously. It is this view of a network—as an integral part of the continuously evolving and self-constituting system—that is truly new about the science of networks. (Watts, 2003, p. 29)

But, argued Watts (2003), understanding networks in this holistic fashion has not only been stymied by inaccurate assumptions but also by inaccurate models and

computing power. Only in the past few decades has the work of sociologists and psychologists been married with the work of mathematicians and physicists to provide the tools necessary to uncover the remarkable characteristics of networks (Barabási, 2002; Watts, 2003). One of these characteristics is the small-world phenomenon.

The notion that the world is a small place has been conventional wisdom for at least a century, but it has only been in the past few decades that the degree of this interconnectedness has been proven both as fact and a property of networks in general (Barabási, 2002; Watts, 2003). The “small world” phenomenon was first tested by the noted psychologist Stanley Milgram, who conducted an experiment to determine the “distance” between any two people in the United States (Barabási, 2002). He instructed a random sample of people from Wichita, Kansas, and Omaha, Nebraska, to attempt to send a letter to one of two target individuals in Massachusetts. If the senders did not know the target individual, then their task was to send the letter to the person they believed would best help them reach the intended recipient. What the experiment revealed was that the number of intermediate links or hops between sender and recipient averaged at 5.5. Rounded to six, this average becomes the “six degrees of separation” made famous by the playwright John Guare in both his play and movie of that name (Barabási, 2002; Watts, 2003).

Watts (2003) revealed that small world theory illuminates a paradox about networks. On the one hand, they are formed of tight clusters. One person exists within a clique of only a few other people who also tend to know the same clique of people. But each person also tends to know at least one person outside of this cluster. When examining an organization, for example, tight clustering might exist among members of

the same team or department, yet these members (actors or egos) have ties to other actors in other teams or departments. Social network analysis employs graphs to map these clustered and non-clustered relationships and certain properties that operate among them, such as path length, frequency, and intensity (Cross & Parker, 2004; Wasserman & Faust, 1994). These maps are useful tools in understanding how networks work:

Networks...can be represented in almost comical simplicity by dots on a piece of paper, with lines connecting them....Although in making such a drastic simplification, we inevitably miss features of the world that we ultimately care about, we can tap in to a wealth of knowledge and techniques that will enable us to address a set of very general questions about networks that we might never have been able to answer had we gotten bogged down in all the messy details.

(Watts, 2003, p. 42)

According to both Barabási (2002) and Watts (2003), the remarkable thing about the small world phenomenon is that its properties are characteristic not only of social networks but networks in general, a part of their self-organizing structure. For example, the World Wide Web exhibits small world structure in which there are a few highly clustered websites (such as Google, Yahoo, YouTube, MySpace, and Facebook) and many more which are connected to only a few other sites (Barabási, 2002). Barabási concluded that we no longer live in a Euclidean world, one in which distance is measured in miles or kilometers. The world has imploded and continues to implode. “Navigating this non-Euclidean world repeatedly tricks our intuition and reminds that there is a new geometry out there that we need to master in order to make sense of the complex world around us” (p. 40).

## *Social Network Analysis*

Social network analysis (SNA) offers one method for mastering this new geometry. It arose from the pioneering work of sociologists, social psychologists, and anthropologists in the early to mid 1900s but is inherently interdisciplinary (Wasserman & Faust, 1994; Watts, 2003). According to Wasserman and Faust, SNA can trace its roots to the work of Jacob Moreno, who invented the field of sociometry, or the study of small groups. “A sociogram is a picture in which people (or more generally, any social units) are represented as points in two-dimensional space, and relationships among pairs of people are represented by lines linking the corresponding points” (Wasserman & Faust, 1994, p. 12). Over time, given advances in technology, these two-dimensional maps have evolved into sophisticated three-dimensional models of social structure, which enable researchers to see aspects of human interaction that might otherwise be missed:

The methods of network analysis provide explicit formal statements and measures of social structural properties that might otherwise be defined only in metaphorical terms. Such phrases as webs of relationships, closely knit networks of relations, social role, social position, group, clique, popularity, isolation, prestige, prominence, and so on are given mathematical definitions by social network analysis. (Wasserman & Faust, p. 17)

Today, SNA forms its own distinct research perspective that places primacy on the relationships that exist among interacting units (Wasserman & Faust, 1994).

According to Wasserman and Faust, SNA is characterized by these tenets: (a) actors are viewed as connected or interdependent and not as autonomous; (b) Ties or connections between and among actors are viewed as channels for the transfer of resources, either

material or nonmaterial; (c) the network structure can be seen as providing opportunities for or constraints on individuals within the network; (d) network models view structures, whether they be social, economic, or political, as lasting patterns of relationships (p. 4).

Used properly, SNA can improve understanding of the webs of inter-relationships that exist within organizations and provide leaders with insights, tools, and strategies that optimize capacity (Cross & Parker, 2004; Krebs, 1996; Krebs & Holley, 2006). An insight that SNA can provide is whether the right connections are in place and the nature of these connections. A tool that SNA can provide is a visual representation of these various webs of relationships and measures that reveal how strong or effective the linkages are within the network. A strategy arising from SNA might be to improve weak linkages or create linkages where they do not currently exist (Krebs & Holley, 2006).

In fact, Krebs and Holley (2006) posited that smart, healthy, and vibrant organizations and communities are created through conscious efforts to “knit the net” by creating and increasing the number of connections between and among actors or organizational members (p. 5). They went on to discern five general patterns characteristic of effective networks. First, their nodes or actors are linked together because of “common attributes, goals or governance;” that is, birds of a feather flock together. At the same time, effective networks reveal diversity. Third, they have redundancy; there are multiple paths between any two nodes. Forth, they have nodes that are more prominent than others, which serve an important function in propagating information, innovation, and learning through the larger network. Finally, most nodes within the network are connected indirectly (through another node or actor) but path lengths between any two actors tend to be short.

Given these characteristics, organizational leaders, such as superintendents and principals, can undertake actions that strengthen and optimize the network through what Krebs and Holley termed *network weaving* (p. 5). The formal leader who undertakes the task of network weaving “has the vision, the energy, and the social skills to connect to diverse individuals and groups and start information flowing to and from them” (p. 7). Fundamental to this process, and central to constructivist leadership, is relationship building and collaboration. Both serve to create “a state of emergence, where the outcome—a healthy community—is more than the sum of the many collaborations. The local interactions create a global outcome that no one could accomplish alone” (Krebs & Holley, p. 10).

#### *District Leadership*

Complex, networked systems or organizations are non-linear, making causality difficult, if not impossible, to determine (Cilliers, 2004). Yukl (2006) argued that a bias remains in viewing leadership strictly as an attribute of an organization’s leader. This bias is rooted in the need to simplify complex organizational behavior: “Stereotypes, implicit theories, and simplified assumptions about causality help people make sense out of events that would otherwise be incomprehensible” (p. 448). Yukl’s insight therefore tempers research that concludes that district leadership has a direct impact on student achievement, such as Waters and Marzano’s findings in their meta-analysis of research focused on this subject (2006).

The Waters and Marzano (2006) study concluded that the correlation between district leadership and student achievement was statistically significant. The specific responsibilities that contributed to improved district leadership and, in turn, improved

student performance were (a) collaborative goal-setting,; (b) non-negotiable goals for achievement and instruction, (c) board alignment with and in support of district goals, (d) monitoring achievement and instructional goals, and (e) use of resources to support the goals for instruction and achievement. A sixth responsibility that unexpectedly emerged from the findings was (f) establishing a relationship with schools, specifically one of “defined autonomy” (p. 13).

Two interesting insights emerge from the Waters and Marzano study. The first arises from an examination of the studies that comprise the meta-analysis. They reflect the bias that Yukl (2006) warned about and the tendency to be self-fulfilling; that is, if leadership was viewed as the province of the superintendent, then the study was structured in such a way that proved this to be true. The other insight is that the attributes Waters and Marzano cited as necessary to improved district leadership and student achievement are just as readily collective attributes.

In their evaluation of research on the topic of reinvention efforts among district central offices to expand student learning, Honig & Copland (2008) concluded that more diffused and reciprocal forms of leadership are necessary to make reinvention successful. Chief among their findings was that learning improvement was predicated on partnership relationships between district central offices and schools.

Partnership relationships...move beyond long-standing debates about whether schools or the central office should direct educational improvement efforts.

Rather, these relationships rest on assumptions that each party—the central office and the schools—has knowledge essential to expanding students’ opportunities to learn and that such distributed expertise should be shared and used. Such

relationships are fundamentally dynamic...and rooted in notions of reciprocal accountability. (p. 4)

### *Summary*

Letting go of established conceptions of leadership is difficult. As the foregoing review of organizational and leadership theory revealed, leadership is increasingly viewed as a shared responsibility that is diffused throughout an organization; yet a bias remains to viewing leadership strictly as an attribute of an organization's formal leader (Yukl, 2006). Yukl argued that this bias is rooted in the need to simplify complex organizational behavior: "Stereotypes, implicit theories, and simplified assumptions about causality help people make sense out of events that would otherwise be incomprehensible" (p. 448).

Evidence of the need to revision leadership in and for the Information Age and an excellent summation of the review of the literature can be found in the findings of a study conducted by the Center for Creative Leadership titled *The Changing Nature of Leadership* (2007). This study concluded that leadership is becoming and must become even more collective and connected: "Connected leadership is an emerging view of leadership as an inclusive and collective networked activity occurring throughout organizations" (Martin, p. 3). Connected leadership, the study revealed, is increasingly essential to meet the complex challenges being faced by organizations today and into the near future.

While respondents in the study considered the challenges within their problem-solving skill set, the time to resolve these challenges was extensive (six months or longer), suggesting that known solutions were no longer viable (Martin, 2007).

Respondents concluded that these challenges demanded more interdependent work, a shift toward rewarding teamwork over individual effort, and enacting leadership as a collective, networked process rather than the heroic effort of one or a few individuals. The chief skill of the formal leader was to create an environment where participative leadership was not only possible but actively cultivated. The study's conclusion echoes constructivist theory's main tenets:

It's no longer the time of the heroic leader—the leader who walks in and takes up all the space in the room. The job of today's leader is to create space for other people—a space in which people can generate new and different ideas; a space where seemingly disparate departments and people in the organization come together and have a meaningful conversation; a space in which people can be more effective, more agile, more prepared to respond to complex challenges.

(Martin, 2007, p. 19)

Creating this space or capacity means recognizing and facilitating not only formal reciprocal relationships but also informal ones, made manifest through social network analysis.

In Chapter Three, the research design and methodology will be overviewed, including the research questions, case study rationale, population and sampling information, data collection methods and instrumentation, and data analysis. In Chapter Four, the data results and analysis are presented. The findings, conclusions, recommendations, and implications for future research are discussed in Chapter Five.

CHAPTER THREE  
RESEARCH AND METHODOLOGY

*Introduction*

The broad question under investigation in this study was whether leadership capacity within a central office administrative team can be informed by social networks that exist at a subterranean or implicit level and amplified by making these networks more explicit. According to Lambert (1998, 2003), capacity is a function of broad-based and skillful participation. Both aspects are achieved through such deliberate efforts as reflection, inquiry, dialogue, and teaming. Social Network Analysis (SNA) makes the case that informal network structures exist within organizations and are more representative of the complex nature and degree of collaborative interactions (Cross & Parker, 2004; Krebs, 1996). SNA can provide what amounts to an organizational x-ray (Krebs, 1996). Making these hidden networks visible offers another way to increase breadth and depth of participation (by leveraging connections that already exist) and also enhance the skill with which these interactions occur.

This chapter serves as a road map for the conduct of the study and is laid out in accordance with Heppner and Heppner (2004), who prescribed that the Methods section include 1) a justification of the philosophical underpinnings of the study, 2) an explanation of the methodology chosen and its appropriateness, 3) a description of the sampling process and the participants selected, 4) a detailing of the instruments that the researcher used, and 5) an illumination of the researcher's data collection and analysis process and procedures (p. 140).

### *Research Questions*

Given the understanding that Social Network Analysis (SNA) supports the promise of uncovering organizational connections and structures that can expand leadership capacity, this study sought to answer these emergent questions:

1. What does social network analysis (SNA)—to be referred to as measures of connectedness—reveal about the nature of leadership capacity within the administrative team of a district central office?
2. How does leadership capacity—as measured by Lambert’s Leadership Capacity School Survey—inform the outcomes of the SNA and vice versa?
3. How do the SNA results affect attitudes of the district’s senior leadership concerning ways of working, organizing, interacting, and enhancing leadership capacity within the district?
4. How do the SNA results affect attitudes of the district’s senior leadership with regard to solving its most intractable problems?

### *The Evaluative Paradigm*

Heppner and Heppner (2004) argued that in order to conduct a research study effectively, the researcher must “first understand the basic tenets and philosophy of a particular paradigm,” in this case a qualitative one (p. 142). Understanding the inquiry paradigm enables the researcher to frame the study appropriately, ask the right questions, and recognize assumptions and limitations more readily.

Because constructivist leadership theory emanates from a phenomenological worldview in which meaning arises—or is constructed—through intersubjective experience (Wilson, 2002), its study profits from a self-similar worldview, one in which

meaning is constructed and made sense of, first by the members of the unit of study (a district administrative team) and secondly and simultaneously by the researcher (Merriam, 1998). Reinforcing the appropriateness of employing qualitative research is the fact that complex systems, such as human organizations, are characterized by non-linear and non-deterministic interactions; in short, causality is difficult, if not impossible, to determine (Cilliers, 2004). As Cilliers made clear, “We cannot deal with reality in all its complexity. Our models have to reduce this complexity in order to generate some understanding” (p. 25). Like Morgan’s (1997) explanation of metaphor, the framing of complex organizations invariably means that something is left out of the picture. According to Cilliers, purely quantitative models are problematic when it comes to complex systems. Qualitative ones are not much better. “No matter how we construct the model, it will be flawed, and what is more, we do not know in which way it is flawed” (p. 25). Rather than give up, Cilliers argued that we must recognize there are inherent limitations to studying complex systems and allow this knowledge to serve “as a creative impulse that continually challenges us to transform our model” (p. 26).

One of the challenges with SNA is that it exposes implicit and informal network structures that are often effective *because* they are informal. The goal of SNA is not to rigidify or formalize these “invisible” networks (Cross & Parker, 2004; Krebs, 2000) but rather to tap into them strategically. “Getting an accurate view of a network helps with managerial decision making and informs targeted efforts to promote effective collaboration” (Cross & Parker, 2004, p. 7). Bar-Yam (2004) reminded us that complex systems require an iterative process of sense-making that alternates the macro- with the micro- view. From this iterative process emerge patterns of interconnectedness that

enable us some ability to comprehend and refine the system. Another feature of complex systems is self-similarity. Like geometric fractals, their emergent patterns repeat themselves at all levels. Discovering patterns of relationships at the micro-level helps to give insights at the macro-level (Bar-Yam, 2004; Wheatley, 1999).

Put another way, organizational capacity is measured by its complexity. Its complexity is measured by patterns of interdependence, formal and informal (Bar-Yam, 2004; Krebs, 1996). These patterns of interdependence can be modeled and mapped using quantitative tools, but their ultimate meaning and value come through a qualitative process of making sense of the data (patterns) that emerge from these tools.

The dialectic between quantitative and qualitative research might best be understood using a construct proposed by Paparone and Reed (2008). They argued that sensemaking occurs along a continuum from logical positivism to solipsism. Logical positivism rests on an objective worldview for both epistemological and ontological questioning. What is real is what can be sensed physically and it is real because it can be touched, heard, smelled, or tasted. Solipsism rests on a completely subjective worldview, both ontologically and epistemologically, in which everything is a mental construct. This study falls somewhere to right of center, in which SNA results provide a degree of objective reality (**O**<sub>objective</sub>) that only gain meaning through subjective analysis and meaning construction (**E**<sub>subjective</sub>) (pp. 3-4).

Consequently, for the purposes of this study, a qualitative design was employed. A qualitative design was also chosen because it reinforced the very process of meaning-making that undergirds constructivist thinking and practice.

### *Rationale for Use of a Case Study Design*

Social network analysis (SNA), as an evaluative approach to visualizing and examining organizations, has broad applicability. Yet each SNA is unique to the organization it maps or x-rays, making SNA case-dependent. For this reason, a case-study approach was employed in this study. Merriam (1998) concluded that the “single most defining characteristic of case study research lies in delimiting the object of the study, the case” (p. 27). Becker (1968) stated that case studies render a comprehensive understanding of the phenomenon under study and evolve “general theoretical statements about regularities in social structure and process” (p. 233). Merriam cited three features of case studies. They are particularistic, descriptive, and heuristic.

This study is particularistic in that it examines a single district administrative team, and because the phenomenon under scrutiny is the social network, both formal and informal, that exists within the aggregate organization. It employs a quantitative tool to make the network more explicit but the key findings of the study do not emerge from the quantitative results but rather from the organization’s reflection on the implications of this data. Although focused on a particular case or phenomenon, case studies are valuable for revealing what such phenomena might reveal more broadly (Merriam, 1998).

This study is descriptive in that it offers rich or thick description of the ways in which hidden or subterranean aspects of a district administrative team are made more explicit using social network analysis. Again, the quantitative tools employed are means to a qualitative end. Rather than the investigator analyzing the quantitative results, the study had the members of the administrative team examine these results and construct

shared meaning from them. This process is in keeping with the constructivist theoretical lens undergirding the study.

Finally, this study is heuristic in that it results in discovery (Merriam, 1998). Case studies help to reveal previously unknown relationships and variables (Stake, 1981), which is the goal of social network analysis. According to Krebs (1996), SNA is a tool designed to enhance organizational self-discovery.

The researcher initially wrestled with whether this study was more appropriately a phenomenological one because social interaction can be viewed as an essential quality of all organizations, and phenomenological studies seek to explore the *essence* of shared experience (Fraenkel & Wallen, 2003; Merriam, 1998). But this study does not so much seek to describe and bracket the essence of *social-ness* within a central office administrative team as it does to map and analyze its manifestation in this specific case. A phenomenological study would begin with the vague notion that social-ness is a phenomenon that exists within and affects organizations and then seek to understand and describe the nature of this essential quality. A case study strives to understand the implications of its existence within a specific situation, person, or organization. Social network analysis, by its very nature, is context specific in that it maps social interactions unique to the organization under investigation.

#### *Population and Sample*

Social network analysis, as its name implies, focuses on social networks, typically specified and bounded. While some naturally occurring social groups have no clear boundaries, “all methods [of analysis] must be applied to a specific set of data which assumes not only finite actor set size(s), but also enumerable set(s) of actors. Somehow,

in order to study the network, we must enumerate a finite set of actors to study (Wasserman & Faust, 1994, p. 32). Wasserman and Faust went on to assert that

...the composition of the actor set depends on both practical and theoretical concerns. The reason for the assumption that the actor set consists of all social units on which we have measurements is quite simple—the methods we discuss here cannot handle amorphous set boundaries. We will always start our analyses with a set (or sets) of actors, and we must be able to enumerate (or label) all members. (p. 33)

Given this fact, the population under study and the sample are often one and the same. This study, for example, studied personnel assigned to a public school district administrative team (central office personnel plus school principals). The population of the study was every person (actor) that comprised this team (N=18) as validated by the superintendent. The sample for the study was this same set of actors.

Since SNA analyzes how a bounded set of actors interacts with other actors in the set, sampling is deliberate rather than random, although for large actor sets, a “sampling” may occur (Wasserman & Faust, 1994). The sample or population is, quite simply, the set of actors on whom the researcher takes measurements.

In SNA, there are two types of actor measurements: structural and compositional. “Structural variables are measured on pairs of actors (subsets of actors of size 2) and are the cornerstone of social network data sets” (Wasserman & Faust, 1994, p. 29).

Compositional variables are actor attributes, such as age, gender, race, or income level. Analyses will always measure at least structural variables, while layering on compositional variables depending on the aims of the research.

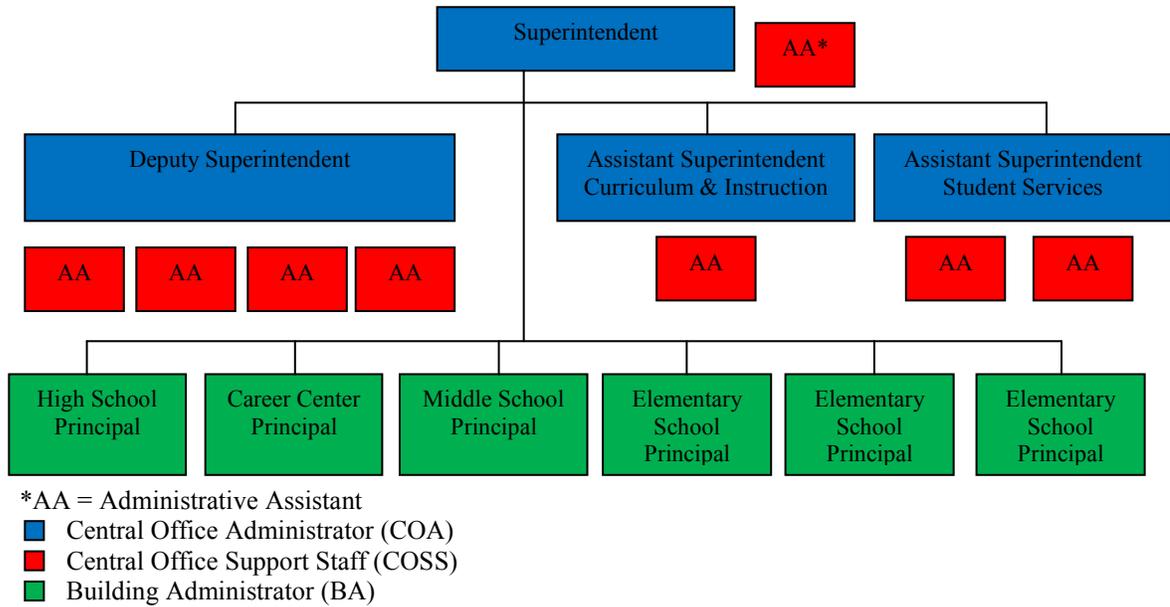
Social network analysis tends to be one-mode or two-mode, although multi-mode studies are also possible. Mode refers to the distinct set of entities on which structural variables are measured (Wasserman & Faust, 1994). One-mode networks tend to be the most common. When analyzing structural variables across two entities, for example two formerly separate companies that have recently merged, a two-mode analysis becomes necessary. For this study, a one-mode analysis was undertaken.

Within one-mode analyses, it is possible to study sets of individual actors and collectives of these sets. Within the school district under study, groups of actors formed sub-groups that comprised the district's administrative team. The aggregate organization formed a one-mode network (Wasserman & Faust, 1994). Within the network structure, SNA examines relationships among pairs of actors. These relations can study such things as individual evaluations (respect, trust, and friendship), transactions, interactions, movements, formal roles, or kinships. This study focused primarily on individual evaluations, which are "measurements of positive or negative affect of one person for another" (p. 37) in comparison to formal roles.

For this study, the unit of analysis was a medium-sized public school district located in the Midwest. The researcher will refer to the district by the pseudonym Rivertide School District. This district was chosen purposefully "based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned" (Merriam, 1998, p. 61).

Figure 3 provides the organizational chart for Rivertide School District. Although members of the administrative team participated in the study, a key role was played by the superintendent. The superintendent was instrumental in identifying those

interconnected aspects of work and capacity-building that the SNA sought to uncover and map. The senior leaders, comprised of the superintendent, deputy and assistant superintendent, and building administrators, were also instrumental in analyzing the SNA results to determine the degree to which they might or might not affect future decisions on such issues as organizational structure, work processes, learning, and sensemaking.



*Figure 3. Rivertide School District organizational chart categorized by sub-group*

Note: Colors correspond to the scheme employed in the network visualizations in Chapter Four.

### *Data Collection*

#### *The nature of SNA data*

Before discussing the specifics of the data collection process, it is helpful to understand the nature of SNA data. According to Wasserman and Faust (1994), social network data are comprised of one or more relations measured among a set of actors. The level at which network data are measured and studied—individual actor, pair of actors, triad of actors, subset of actors or the entire network—is referred to as the unit of observation (Wasserman & Faust, 1994). In most studies, the unit of observation is the

individual actor. Data are collected by observing, interviewing, or surveying individual actors about their interactions with other members of the network.

The level at which the data are modeled and summarized is referred to as the modeling unit. Like the unit of observation, the modeling unit can exist at multiple levels, from actor through subgroup to sets of subgroups or entire network (Wasserman & Faust, 1994). The modeling unit is categorized by the properties being analyzed. For example, if a researcher is studying the choices an individual actor (Actor A) makes in selecting who to go to for advice, the modeling unit might remain at the actor level. If, however, the researcher seeks to assess whether those selected by Actor A choose that actor in return, a dyadic model would be chosen. If analyzing all such interactions within an organization, the modeling unit would be the network.

Because SNA data concerns relations between actors, it is important to account for two “relational qualifications” (Wasserman & Faust, 1994, p. 44). The first of these qualifications determines whether relations are *directional* or *nondirectional*. If analyzing communication flow, for example, how that flow is directed becomes important. The second qualification is *dichotomous* versus *valued*. Dichotomous relations are measured as either present or absent. Valued relations are measured along a range of values indicating strength, intensity, frequency, or other measures of degree (Wasserman & Faust, 1994).

Wasserman and Faust (1994) listed a series of data collection techniques for SNA, including questionnaires and surveys, interviews, observations, archival records, and experiments. Of these techniques, the questionnaire is the most common. “Questionnaires are most useful when the actors are people, and the relation(s) that are being studied are

the ones that the respondent can report on” (Wasserman & Faust, 1994, p. 45). A questionnaire was employed for this study, modeled on formats detailed by Wasserman and Faust (1994), Cross and Parker (2004), and Krebs (direct communication).

Questions employed for SNA are constructed using one of three formats: roster vs. free recall, free vs. fixed choice; and ratings vs. complete rankings (Wasserman & Faust, 1994). The first of these formats concerns whether respondents are given a complete list of all other actors about whom their interactions are being measured or whether they are merely asked to recall interactions freely. For the purposes of this study, a roster was employed so as to not leave responses to chance. In other words, this study was interested in how every member of the administrative team might or might not interact with every other member.

Free versus fixed choice refers to whether respondents are constrained in the number of choices or interactions they record. For example, a study might wish to limit the number of people one could claim as “most trusted.” If one is unconstrained in the number of nominations he or she can make, then the data are categorized as free choice. This study employs a mix of both free and fixed choice.

Ratings refer to the degree to which an actor values a particular tie to another actor. For example, the frequency with which one actor meets with another is measured on a rating scale (once a day, once a week, once a month, not at all) Rankings are employed when an actor assesses an entire set of actors against a single tie. For example, respondents might be asked to rank order the people they most favor when dealing with sensitive issues. According to Wasserman and Faust (1994), “full rank-orders and rating scales with multiple response categories produce *valued* relations (p. 48).

### *The collection process*

Data collection was guided by ethical practice and the “fundamental responsibility of every researcher to do all in his or her power to ensure that participants...are protected from physical or psychological harm, discomfort, or danger that may arise due to research procedures” (Fraenkel & Wallen, 2003, pp. 57-58). To ensure such protection, it is a responsibility of the researcher to obtain the informed consent of those involved in the study. For this study, the consent form included the following: acknowledgment of the right to participate voluntarily, the purpose of the study and its procedures, the right to ask questions and obtain results of the study, and the right to have one’s privacy protected.

Because SNA relies on individual actors reporting their relationships with others, care was taken to frame questions in such a way that they got at the most professional aspects of these interrelationships. However, as Cross and Parker (2004) made clear, SNA unearths aspects of organizational behavior and culture that can make some participants defensive. Social network analysis is new enough that many are prone to misunderstand the data, so the researcher took precaution to guide the organization’s self-analysis of the SNA results so as not to constrain emergent insights but also not to allow misunderstandings to fester.

For the specific purposes of this study, the researcher undertook a three-phase collection strategy. Each phase was designed to collect data that would facilitate answering the questions under study.

*Phase One:* In this preliminary phase, the researcher sought and obtained permission from Rivertide School District to conduct the study (Appendix A & B). He

then scheduled and conducted a preliminary interview with the superintendent to explain the aims of the study and the mechanics of conducting it so as to minimize impact to the functioning of the central office (Appendix E). This interview also sought to obtain insights from the superintendent on his/her awareness of informal network structures and the degree to which they remained tacit or explicit. Also obtained were the types of ties that the superintendent believed were important to measure about the social network of his/her organization in order to gauge its capacity. Based on these responses, the researcher constructed and refined the network analysis questionnaire found in Appendix F. Subsequently, the same instrument was also sent to the deputy and assistant superintendents and the building administrators (N=8) electronically for their responses.

*Phase Two:* In this phase, the researcher had all members of the administrative team complete Lambert's Leadership Capacity School Survey (LCSS) found in Appendix G, as well as the SNA questionnaire (Appendix F). The researcher scored the LCSS and input the data from the SNA questionnaire into the software application, producing network maps and measures.

*Phase Three:* In this phase, the researcher presented the data for both the LCSS and the SNA to the senior leaders of the administrative team, consisting of the superintendent, deputy and assistant superintendents, and school principals (N=9), because it was this group of individuals who would best be able to leverage the results and emergent insights to expand leadership capacity within the total organization. This senior leaders group self-assessed the data (Appendix J) and drew conclusions from them. Additionally the researcher asked members of this group a series of questions designed to ascertain the ways in which a more explicit understanding of network

structures and interactions might contribute to capacity-building. This self-evaluative process yielded transcripts that were then analyzed and coded.

### *Instrumentation*

Several data collection instruments were used in this study, which encompass the three types identified by Fraenkel and Wallen (2003), based on who provided the information: researcher, subject, and informant. These included (a) an initial interview with the superintendent; (b) a hybrid subject-informant survey, the SNA survey; and (c) Lambert's (2003) Leadership Capacity School Survey (LCSS).

*Interviews.* The most common of qualitative data-gathering tools other than direct observation, the interview enables the researcher to obtain data he or she cannot obtain otherwise (Merriam, 1999). The interview is necessary in order to understand a participant's thoughts, feelings, intentions, or other unobservable attitudes and beliefs. A semi-structured interview (Merriam) was employed for all interviews: the first being an interview with the superintendent; the second an electronically-delivered interview with the remaining senior leaders, comprised of the deputy and assistant superintendent, and building principals; and the third being a group interview with this entire group. The goal of the study was not to impose any interpretation of the SNA survey and LCSS data but rather to enable the senior leaders of the administrative team to allow meaning to emerge through their own engagement with the data. The interviews were structured to the extent that the researcher needed to explain and guide understanding of SNA. In the initial interview with the superintendent, for example, it was necessary to draw out the types of interactions the superintendent believed were important to "unearth" and assess. The researcher explained how SNA works in general and provided sample questions

developed by Cross and Parker (2004) to uncover such aspects as collaboration, information-sharing, rigidity or flexibility, and supportiveness, then allowed the superintendent to ruminate on the kinds of interactions that might be interesting to explore using the lens of SNA.

The interview instruments (Appendix E & H) were constructed to conform to protocols and standards of practice outlined in numerous texts on qualitative research (Fraenkel & Wallen, 2003; Heppner & Heppner, 2004; Merriam, 1998; Seidman, 2006). Foremost was ensuring that the interviews duly respected both the culture of the organization being investigated, as well as each individual within it. Questions were framed openly with the intent of avoiding interviewer bias or leading the interviewee to a predetermined answer (Fraenkel & Wallen). It should be noted, however, that the initial interview with the superintendent and the group interview were sufficiently structured and guided to account for participant unfamiliarity with the construct of leadership capacity, as well as SNA. This necessitated a form of tutorial on the front end of the interview and occasional clarifications of the way in which capacity and SNA worked in order to ensure responses were as informed as possible.

*SNA Survey.* Social network analytic tools rely on data sets of binary social interactions. These are captured through a questionnaire that required all participants to identify specific other actors with whom they have the kinds of interactions under scrutiny, such as to whom they might go for help with a particular problem. The researcher initially prepared a draft instrument based on recommendations suggested by Cross and Parker (2004) in their book, *The Hidden Power of Networks*. This instrument was later refined by the researcher based on data gained from the initial interview with

the superintendent to account for additional interactions of significance that could only be articulated by the superintendent (Appendix F).

As already discussed, a roster of all administrative team personnel was embedded in the questionnaire and respondents were unconstrained as to how many actors they could identify in answer to a given question. According to Wasserman and Faust (1994), social network data has face validity but little research has been done to assess “the construct validity of measures of network concepts” (p. 58). Reliability is also problematic, and a limitation of SNA, in that it seeks to measure social dynamics that are not static over time, thus not allowing for test-retest assessment of reliability. In some ways, these limitations were offset by the researcher’s efforts to communicate awareness of SNA’s drawbacks, as well as the employment of the case study methodology and self-assessment of the data by the organization. In short, the data was context- and situation-dependent but highly relevant to the case under study.

The data from the SNA survey was processed using the Organizational Risk Analyzer (ORA), a software application created by Dr. Kathleen Carley and colleagues from the Institute for Software Research, School of Computer Science and the Center for Computational Analysis of Social and Organizational Systems (CASOS) at Carnegie Mellon University. According to the *ORA User’s Guide*

ORA is an analysis tool designed to help the user evaluate one or more networks. It can be used to assess the nature of, features of, change in, and determinants of complex networks. A large variety of networks can be assessed including, but not limited to, social networks, activity networks, task networks, knowledge networks, supply chains, and communication networks. Using ORA questions

such as the following can be addressed: what is critical, are there groups of interest, are there patterns of interest, how might interventions impact the network, who is critical, are there emerging groups, how is the network changing. (Carley, Columbus, DeReno, Reminga, Moon, 2008, p. 10)

*LCSS*. Lambert's *Leadership Capacity School Survey* (LCSS) is a subject survey that was modified sufficient to make it appropriate to a district administrative team. In her study on the reliability and validity of Lambert's LCSS, Pierce (2007) found the LCSS to be highly reliable, especially when used for self-assessment and collaborative reflection, but lacking in construct validity. Lambert's initial LCSS was framed around six constructs. Pierce found only four to be valid. To offset the lack of construct validity, Pierce created two reduced forms of the survey that were both reliable and valid. One of these reduced forms was employed for the purpose of this study (Appendix G).

### *Data Analysis*

#### *Macro approach*

"Data analysis is the process of making sense out of the data" (Merriam, 1998, p. 178). It occurs simultaneously with data collection and is iterative in nature. In many ways, data analysis is a complex process, in which meaning *emerges* from "moving back and forth between concrete bits of data and abstract concepts, between inductive and deductive reasoning, between description and interpretation" (Merriam, p. 178).

This study was marked by a sort of analytic echo in which the researcher not only analyzed data gathered throughout the study but also facilitated and then analyzed the self-analysis conducted by study participants. This meta-analysis could be said to produce

simply richer data that was integrated into the evolution of categories, themes, and theories.

According to Merriam (1998) “category construction is data analysis” (p. 180). It involves a step-by-step process of analyzing the first interview transcript, grouping insights and notes into lists, comparing these lists with those created from other instruments, and eventually constructing categories. These categories serve to illuminate the purpose of the study and answer the research questions.

For the purposes of this study, the researcher began by mining the transcript of the interview with the superintendent, using the data codes in Appendix I, not only to help shape the SNA survey but also to detect words, phrases, and concepts that spoke to issues centered on leadership, complexity, and capacity. This effort was followed by preliminary analysis of the data collected from the SNA survey and LCSS. The researcher was careful not to form definitive conclusions from the survey data, as this was the domain of the administrative team during the focus group interview. The researcher primarily focused on assembling and displaying the data in such a way that it led to productive and meaningful conversations during the focus group (Appendix J). Later, the researcher returned to the survey data to look for amplifying information and to clarify insights that emerged from the focus group discussion.

Using the transcripts and notes from the interviews, the researcher continued to refine the development of categories until they subsumed all the data, were mutually exclusive, sensitized, and conceptually congruent (Merriam, 1998, p. 184). The researcher’s ultimate goal was to facilitate a more thorough understanding of the case

under study and conjointly to assess the value of SNA in this sensemaking and capacity-building endeavor.

*Question by question analysis*

*Question 1 – What does social network analysis (SNA)—to be referred to as measures of connectedness—reveal about the nature of leadership capacity within the administrative team of a district central office?* Leadership capacity is defined as broad-based and skillful participation (Lambert, 2003); therefore, SNA should illuminate both of these dimensions. Answering this question required the researcher, as well as the participants, to examine the *ORA* results in detail. These results, which were both visual representations of the networks that exist within the administrative team, as well as measures of connectedness, enabled analysis of who was interacting with whom, who might be left out, the frequency of their interactions, the directions of these interactions, and the nature of these interactions, all of which spoke to how diffused or widespread the work of leadership was. Less obvious in these results was the degree of skill involved but a form of skill was nonetheless present, one that was less deliberate and overt and more organic and nuanced. Analyzing skill required the researcher to examine the *ORA* data, as well as the interview data, and deduce ways in which the patterns or webs of relationships reflected a sort of hive mind or distributed intelligence (Kelly, 2003; McKelvey, 2004) that demonstrated an innate ability within the organization to solve problems by seeking out the right person at the right time.

*Question 2 – How does leadership capacity, as measured by Lambert's Leadership Capacity Staff Survey, inform the outcomes of the SNA and vice versa?*

Answering this question involved an iterative comparison of the LCSS results with the

SNA Survey results, as well as examining the senior leaders group interview transcript. Given the case study methodology and the constructivist worldview undergirding this study, the quantitative data had no inherent meaning; rather it served as a heuristic by which the researcher and the participants were able to discover the relationship between capacity and the informal network structures that existed within the administrative team.

*Question 3 – How do the SNA results affect attitudes of the district’s senior leadership concerning ways of working, organizing, interacting, and enhancing leadership capacity within the district?* The SNA results identified who interacted with whom on a range of matters but not the underlying reason why. The objective of the senior leaders group interview was to uncover the underlying causes or triggers for these interactions. Answering this question involved both close observation of the dynamics that took place during the senior leaders interview and analysis of the interview transcript in order to determine if one of these triggers or causes was rooted in the need to make sense of rules, policies, ways of working, and understanding.

*Question 4 – How do the SNA results affect attitudes of the district’s senior leadership with regard to solving its most intractable problems?* Answering this question involved a qualitative analysis of the senior leaders group interview with the superintendent, deputy and assistant superintendents, and principals, employing the other interview and survey results to inform this analysis.

#### *The Researcher’s Biases & Assumptions*

Heppner and Heppner (2004) suggested that a researcher speak to his or her qualifications and more fully describe his or her role as researcher. Invariably, this demands a discussion of his or her limitations and biases.

Constructivist theory argued that members of an organization co-evolve meaning (Lambert, 2002). This includes formal leaders, who create an environment—space or capacity—in which collaboration and participation are encouraged and nourished (Martin, 2007). The researcher, therefore, must adopt a similar stance, but he always runs the risk of imposing his own views or mindset into or onto the proceedings.

One significant limitation of this researcher was his lack of experience in social network analysis before undertaking this study. He taught himself the Organizational Risk Analyzer (ORA) software, though he made every effort to secure aid from individuals who could bolster his expertise. In some ways, this naiveté helped to mitigate preconceptions and biases, but it also limited his ability to employ the software to its fullest potential. Another limitation was that his choice of the ORA application was based on factors such as ease of use and learnability rather than on other aspects, such as its robustness, that a more informed researcher might use to evaluate its merits.

Watts (2003) warned of a major limitation of SNA—its inability to account for organizational dynamics—sufficient to give some pause as to its merits as an analytical tool. This study touts the value of thinking and acting more complexly, yet at the same time adopted a tool that seems to oversimplify its object of study. As Cilliers (2004) conceded, researchers have little other choice. The world is simply too complex not to chunk it up into manageable pieces. One way the researcher sought to overcome oversimplification was to adopt a strategy similar to Bolman and Deal (2003) and Morgan (1997), which was to piece together multiple perspectives in order to get at the larger view. Social network analysis was not seen as the sole means to understand organizational leadership capacity but as one contributing way. Recognizing that

interpersonal network dynamics are important, the researcher sought to cultivate insights in which these dynamics were explored by study participants in relation to the SNA results.

### *Summary*

This chapter has overviewed the process of research that was undertaken in order to answer the study's questions and fulfill its purpose. It reviewed the evaluative paradigm undergirding the study and provided rationale for the employment of the case study methodology. It discussed the study's population and sample and their unique attributes within the SNA framework. Next came a discussion of the data collection process and the specific phases of collection for this study, along with an overview of the instruments employed. This led to an overview of the ways that the researcher would analyze the data in order to yield the findings of the study and, finally, to a discussion of the researcher's qualifications, biases, and limitations.

Chapter Four will present the data outcomes of the study and an analysis of these outcomes in light of the study's theoretical underpinnings in order to answer each of the study's questions. Chapter Five will summarize the findings, account for their limitations, and discuss possible implications for future research.

## CHAPTER FOUR

### PRESENTATION AND ANALYSIS OF DATA

#### *Introduction*

The challenges facing public education are immense. Old ways of thinking, outdated organizational models, and simplistic conceptions of leadership limit the ability of school leaders to tackle the thorny issues they face on a daily basis (Drath, 2003; Lambert, 2002, 2003; Wheatley, 1999; Yukl, 2006). Newer theories of organizations and leadership suggest that new conceptions of both are essential if these problems are to be solved (Lambert, 2002; Martin, 2007; Wheatley, 1999; Yukl, 2006). These new conceptions must account for more diffused, collaborative, and networked ways of working and making sense of things (Drath, 2003; Kelly, 2003; Ogawa & Bossert, 1995). This study, framed by multiple and interrelated theories, among them constructivist leadership, leadership capacity, and complexity and social networks, sought to employ an Information-Age tool—social network analysis—to examine leadership and ways to expand its capacity within the administrative team of a district central office.

This chapter presents facets related to the conduct of the study and analysis of the data. First, it reviews the study's design and data collection methods, including the mechanics of data collection and tools employed. Then, it presents an overview of the data analysis process and the study's setting and participants. It next presents the findings of the various instruments employed in the study and the themes emerging from the data. While this study employed quantitative tools, the quantitative data produced by these tools only served to drive self-discovery by the study's participants. It was their

verbalization of this discovery process that formed the core of the study's data, which was analyzed for emergent themes and patterns.

### *Study Design*

Social network analysis (SNA), by its nature, is context specific in that it maps social interactions unique to the organization under investigation. Therefore, the researcher undertook a single case study of a school district situated in the shadows of a large Midwestern metropolitan area in order to make explicit the social networks that existed among the staff of the district's administrative team, comprised of central office staff and building principals. Also, given the nature of SNA, the participants were, in essence, self-evident or self-selected by their mere inclusion in the administrative team. That is, the unit of analysis was more correctly the collective entity rather than its component parts.

In reply to the question, why this school district, the researcher relied on both accessibility and the willingness of the district to participate. A prior attempt to work with another district failed, due to the perceived imposition of the study at a time when other priorities were pressing. For the purposes of the study, which were to examine the value of SNA in harnessing and expanding leadership capacity, the size and type of organization under study was less important than the open-minded willingness of the organization to explore the potential of SNA to assist in sustaining core strengths and overcoming weaknesses, especially those that might be invisible to the casual eye.

### *Data Collections Methods*

The researcher initially secured approval for conduct of the study from the district's superintendent (Appendix A& B). He then completed and submitted the

requisite Institutional Review Board (IRB) application necessary to undertake research involving human subjects. Upon IRB approval, the study commenced in earnest and involved three phases.

The first phase started with all potential participants being sent an Informed Consent (Appendix C). Of 18 possible members of the administrative team (N=18; constituting the social network under analysis), 15 responded that they would participate in the study (83%). The remaining 3 declined to participate. Employing a simple interview protocol (Appendix D), the researcher conducted an in-person interview with the superintendent designed to provide insights that might influence the development of the survey instruments (Appendix E). In fact, based on this interview, the researcher added a question on the topic of courage to the SNA survey. To bolster internal validity through member check, the interview was transcribed and given to the superintendent for his review and clarification (Merriam, 2002). The same set of questions asked of the superintendent was then asked of the subordinate superintendents and the building principals, only via email, and their email response served as a digital transcript.

In the second phase of the study, participants completed a social network analysis survey (Appendix F) and Lambert's (2003) Leadership Capacity School Survey (Appendix G), either by hand or electronically. The results from the former were entered into the Organizational Risk Analyzer (ORA) software and the results checked by Mr. Jeff Reminga, a developer of the ORA software at Carnegie Mellon University. Mr. Reminga offered additional consultation that enhanced data interpretation and preparation for a briefing for the district leadership that depicted the various social networks

embedded in the organization (J. Reminga, personal communication, May 21, 2009; June 6, 2009).

Phase three involved a largely unstructured group interview with the senior leaders of the district (N=9; the superintendent, deputy superintendent, two assistant superintendent and five building principals) in which the results of the surveys were presented (Appendix J) and participants were asked to comment on them. The results were primarily a set of social network diagrams comprised of nodes and lines or edges that revealed how each entity or participant was connected to others. For the sake of privacy and as a condition of participation, names were made anonymous. Thus, it was not possible to make definitive judgments or conclusions about the social connections revealed. All participants could do was observe patterns of relationships and note how nodes/agents interacted specific to the question asked. The researcher acted to guide the conversation and process of discovery but avoided drawing any conclusions on behalf of the group. The discussion was taped and transcribed.

#### *Research Questions*

The question of whether social network analysis might offer insights into meaningful ways school leaders could expand capacity and deal more effectively with the challenges confronting education in the 21<sup>st</sup> Century led to the following research questions:

1. What does social network analysis (SNA)—to be referred to as measures of connectedness—reveal about the nature of leadership capacity within the administrative team of a district central office?

2. How does leadership capacity—as measured by Lambert’s Leadership Capacity School Survey—inform the outcomes of the SNA and vice versa?
3. How do the SNA results affect attitudes of the district’s senior leadership concerning ways of working, organizing, interacting, and enhancing leadership capacity within the district?
4. How do the SNA results affect attitudes of the district’s senior leadership with regard to solving its most intractable problems?

#### *Process of Data Analysis*

Data analysis for this study was multi-faceted in an attempt to achieve internal validity through triangulation (Merriam, 2002). The results of the SNA survey were entered into the ORA software and yielded a series of network maps (using the software’s embedded visualization feature) that were employed to facilitate and spur discussion among the district’s senior leaders (Appendix J). These maps were anonymized in order to protect the identities of the participants; thus no explicit correlation was (or will be) made between the code and the person or specific position it represents. However, based on the literature review and insight that within networks *birds of a feather flock together* (Krebs & Holley, 2006, p. 4), the researcher differentiated the codes into three subgroups. Those nodes representing Central Officer Administrators (superintendent, deputy superintendent, and two assistant superintendents) were designed with a COA code. Those nodes representing Central Office Supporting Staff (administrative assistants) were coded with a COSS code. Finally, those nodes representing Building Administrators were coded with a BA code. All transcripts were coded using the codes found in Appendix I.

As analysis progressed, the researcher realized that themes emerged not only from the expected source of the interview transcripts analysis. Themes also emerged from the ORA network maps. Finally, they emerged from field observations that occurred throughout the study. Each source of theme data informed the other.

### *Setting*

The case under analysis was a small Midwestern school district comprised of a central office, three elementary schools, a middle school, a high school, and a career center. Rivertide School District (pseudonym) balances rural living with easy access to a large urban center. For the 2008-2009 school year, the district employed a certified staff of 237 and enrolled 3027 students.

The face-to-face interviews occurred within the district's central office, located in town center. The building is non-descript and contemporary, and its interior austere but not uninviting. Occupying the central office building are the superintendent, subordinate superintendents, and their administrative assistants. Meetings between the central office and building administrators typically occur within this building.

The non-descript setting reinforced the intent of the study, which was to reveal SNA's universal ability to inform institutions about aspects of their ways of organizing and working that would affect how they deal with complex challenges. Any pre-existing uniqueness did not matter as much as the embedded and often hidden uniqueness that could be revealed through SNA.

### *Participants*

For the purposes of this study, participants were those that comprised the district's administrative team, which included central office administrators (superintendent and

subordinate superintendents), central office support staff (administrative assistants), and building administrators (principals only). In all, the 15 participants represented 115 combined years of service to the district, with the newest member having been with the district only one year and the oldest 31 years. The average years of service with the district was 6.8.

Leading the district is Dan Reeves (pseudonym), who at the time of the study had been superintendent for four years. An affable man who has dedicated his life to education, he recently completed a doctorate exploring professional learning communities. He welcomed the study but expressed concern that its focus on interpersonal relationships might cause undue tension among the staff if not handled properly. This expression of concern was the first of several such expressions that revealed issues of trust that will be addressed under theme analysis.

The other participants included the deputy superintendent (male), who had been with the district 4 years, and two assistant superintendents (female), who had been with the district 2 and 11 years respectively. Along with 5 building administrators, they formed the senior leadership of the district.

The 5 building administrators ranged from a young principal (male) with only one year in the district to more seasoned principals (two male and two female) with between 2 to 5 years in the district. Among this group were also concerns centered on trust as to how results of the surveys and questionnaire would be framed and reported.

The last sub-group of participants was comprised of six administrative assistants, all female. Members of this group had worked with the district for 6, 7, 9, 11, 16, and 31 years respectively, making their collective tenure the highest among the three groups.

Although not studied in detail, issues of tenure and performance did surface during the final interview with the district's senior leaders. Within the SNA framework, tenure provided a point of commonality that could explain the strong inter-connectedness of this sub-group. This characteristic and others will now be explored in greater detail.

#### *Organizational Risk Analyzer (ORA) Data*

The Organizational Risk Analyzer (ORA) software application is freeware available from the Center for Computational Analysis of Social and Organizational Systems (CASOS), a center within the Institute for Software Research, School of Computer Science, Carnegie Mellon University. According to the ORA User's Guide, the software was created to help users evaluate one or more networks including "social networks, activity networks, task networks, knowledge networks, supply chains, and communication networks" (Carley, Columbus, DeReno, Reminga, & Moon, 2008, p. 10). As the User's Guide states, "Networks are ubiquitous. Everyone and everything is constrained and enabled by the networks in which they are embedded" (p. 10) and everyone typically belongs to multiple networks, a fact for which ORA accounts. The ORA application allows for robust and intricate network analysis, far beyond the scope of this study. As will be discussed in Chapter 5, it offers substantial capacity to support expanded SNA research within the educational domain.

Network visualizations were created for each question posed in the SNA Survey (Appendix F). To recap the process involved, participants were given a set of questions that asked them to identify other members of the staff with whom they interacted in specific situations. A list of all members of the network was included and participants annotated those boxes beside the names that applied. For example, when asked who he

considers his friends, Actor A might select Actors C, F, G and H. A spreadsheet was then created for each question, compiling all such actor-to-actor interactions, which looked like that in Figure 4. A “1” in the box indicates an interaction was identified, while a “0” indicates no interaction was identified.

	Actor A	Actor B	Actor C	Actor D	Actor E	Actor F	Actor G	Actor H
Actor A	0	0	1	0	0	1	1	1
Actor B	1	0	1	0	1	0	0	0
Actor C	0	0	0	1	1	0	0	1
Actor D	1	1	1	0	1	0	0	1
Actor E	0	0	1	1	0	1	1	0
Actor F	0	1	0	0	1	0	1	0
Actor G	0	1	1	1	0	1	0	0
Actor H	1	1	0	0	1	1	1	0

*Figure 4: Example of ORA data input.*

Note: The yellow diagonal highlights that an actor cannot interact with him or herself.

### *Network Visualizations*

The network visualizations created for each question asked on the SNA survey (Appendix F) follow in Figures 5 through 16. The title of each figure is comprised of a keyword identifier for that network based on the core attribute being examined.

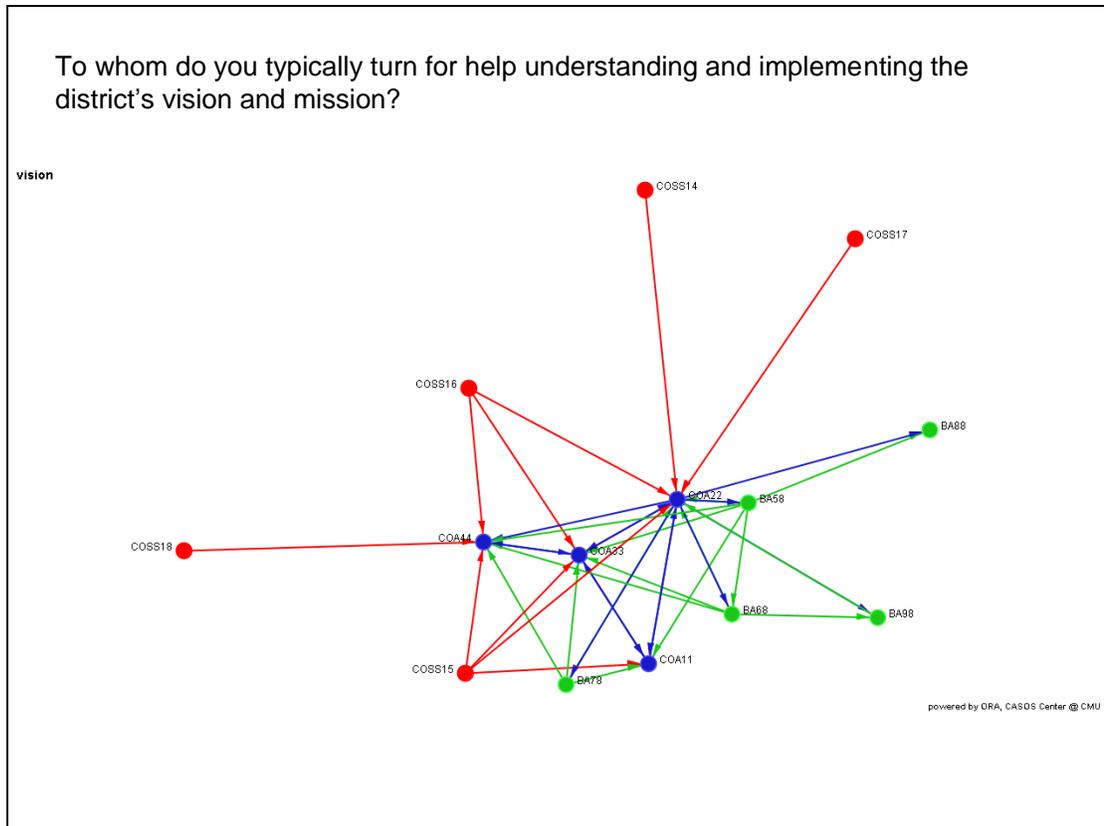
Following these network visualizations are several other graphs and data output by ORA, with a brief explanation of each. The researcher employed these visualizations to stimulate discussion and discovery during an interview with the district’s senior

leadership, which in turn led to the emergence of patterns, trends, and themes that constituted the study's essential data.

In Figures 5-16 that follow, a consistent color coding is employed. Central Office Administrators (COA), consisting of the superintendent, deputy, and assistant superintendents are represented by blue dots. Building Administrators (BA), consisting of the school principals, are represented by green dots. Finally, the Central Office Supporting Staff (COSS), consisting of administrative assistants, is represented by red dots.

When creating the visualizations within ORA, the researcher chose to hide all isolates, primarily to focus on connected interactions but also to offset the way in which isolates decreased the size of the network diagram. By eliminating the isolates, the remaining network enlarged within the ORA visualizer. This fact will be discussed further in the Limitations section of Chapter 5.

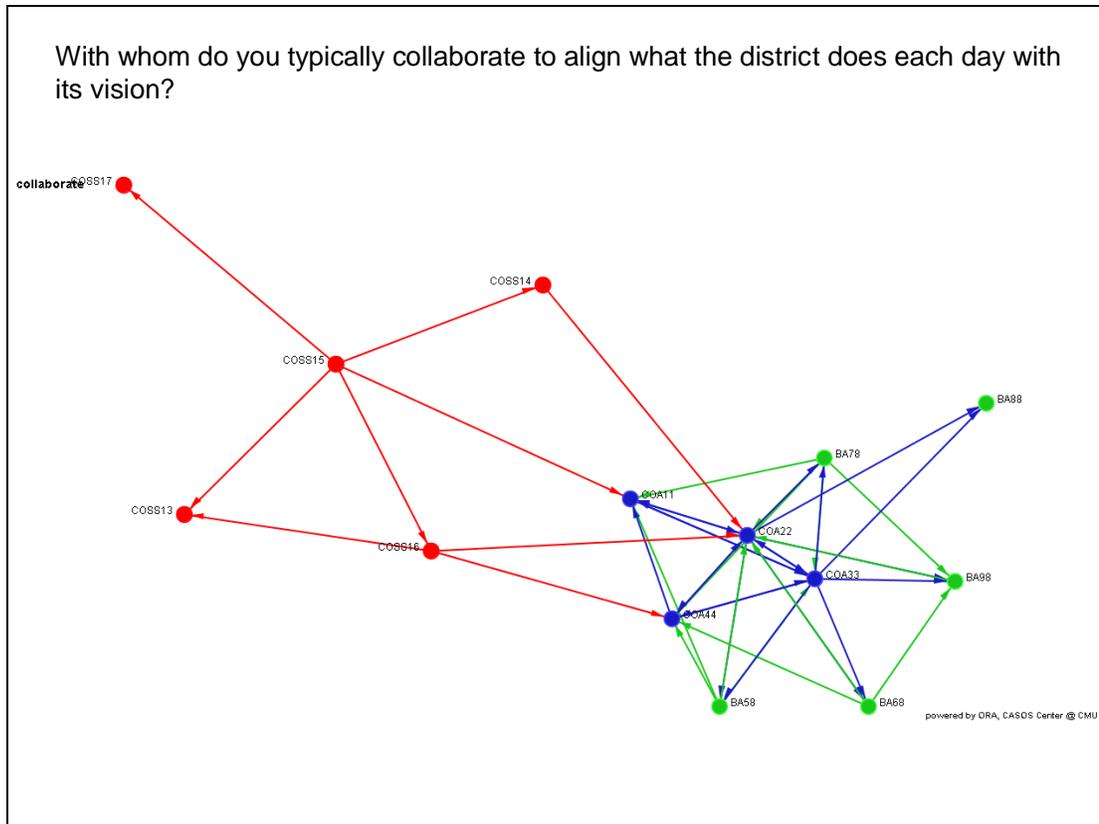
Figure 5 depicts interactions related to understanding and implementing the district's vision and mission. COA personnel turned primarily to each other, although in some instances COA also turned to BA. BA turned primarily to COA but also each other. Of note, COSS turned exclusively to COA. Some turned only to a single COA, while others turned to multiple COA. There were no isolated nodes (isolates) within this network.



*Figure 5: Vision network depicting social interactions related to vision and mission*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

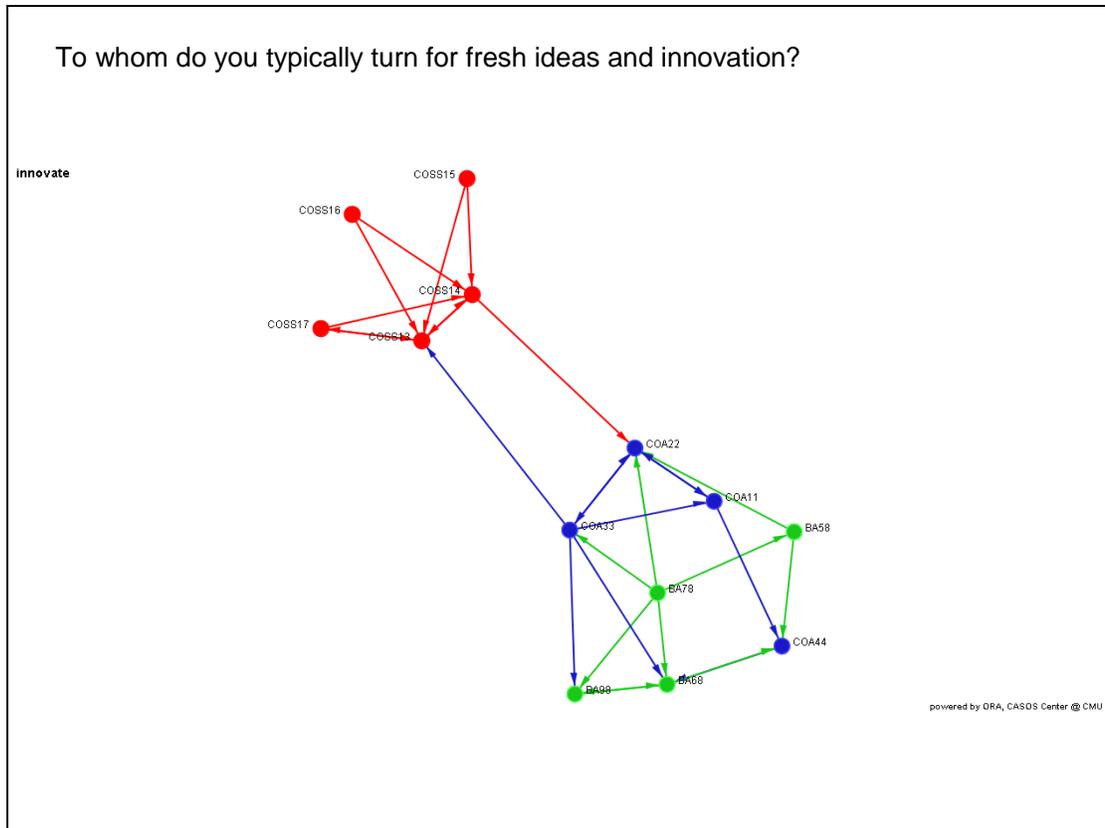
Figure 6 reveals interactions related to collaboration, particularly those collaborative interactions related to aligning district activities and programs with its vision. The pattern of interactions continues to show that COA turned largely to each other and sometimes to BA. BA turned largely to COA but also to each other. COSS turned exclusively to each other or to COA. The other sub-groups did not turn to the COSS. One COSS agent did not reply, creating one isolated node (hidden).



*Figure 6: Collaboration network depicting social interactions related to collaboration*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

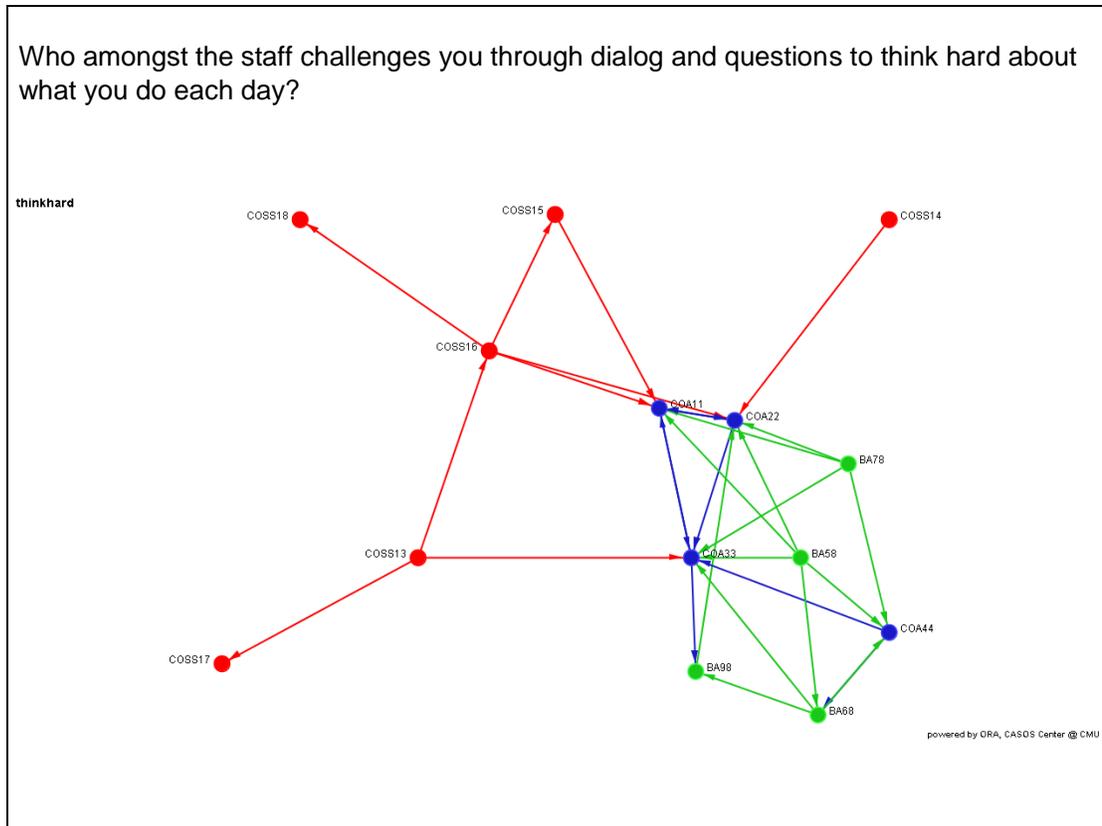
Figure 7 depicts those social interactions centered on new ideas or innovation. The COA remained clustered, although two COA turned outward to other sub-groups. The BA turned to each other and to the COA. One BA, BA78, interacted with a large number of other persons in the network. The COSS remained clustered, almost detached, with one link into the COA sub-group and one link coming in from that sub-group. One COSS agent and one BA agent did not respond to this question, creating two isolated nodes (hidden).



*Figure 7: Innovation network depicting social interactions related to innovation and fresh ideas*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

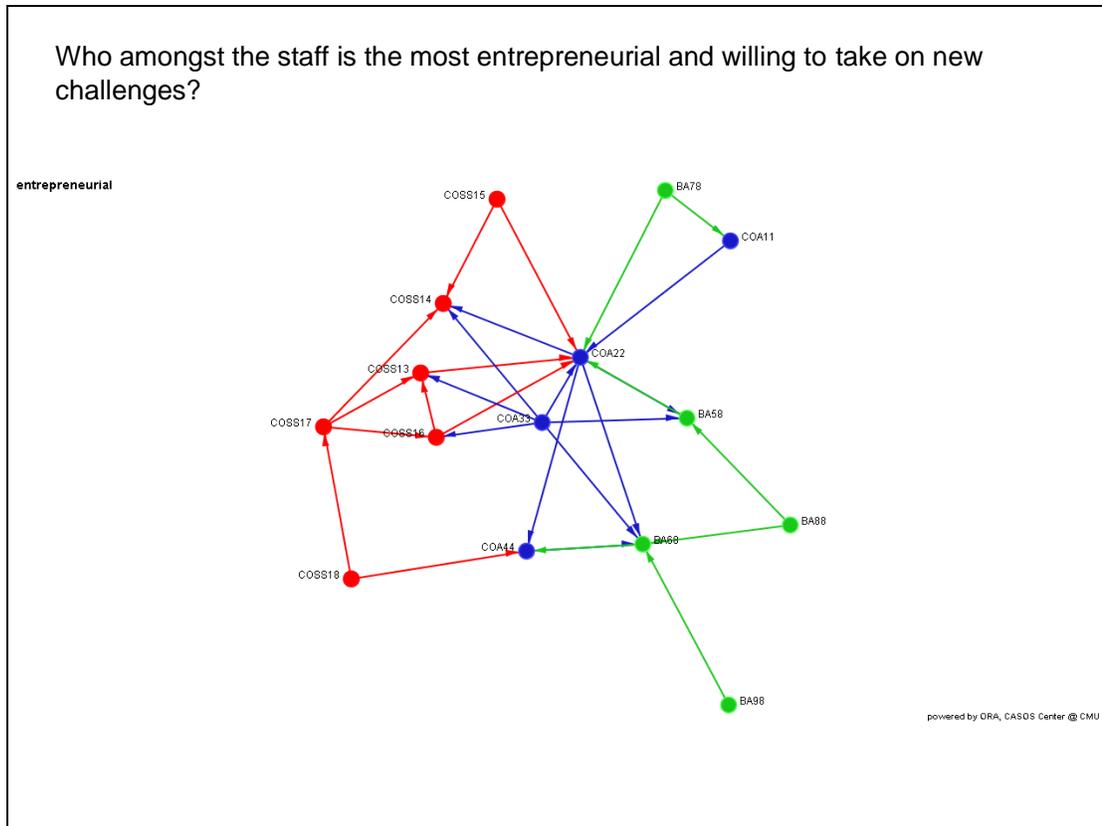
Figure 8 shows interactions based on who within the network challenges others to think hard about their work. There remained a tight triangle among three members of the COA, with COA44 being a resource for the BA more than with the other COA. The BA turned to the COA and each other but also revealed a tendency to engage in more total interactions. The COSS turned to each other or to the COA and their total interactions were limited. Three of them were connected to the network by only a single interaction. One BA did not reply to this question, creating one isolated node (hidden).



*Figure 8: Think hard network depicting social interactions related to being challenged by colleagues to think hard about one's work*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

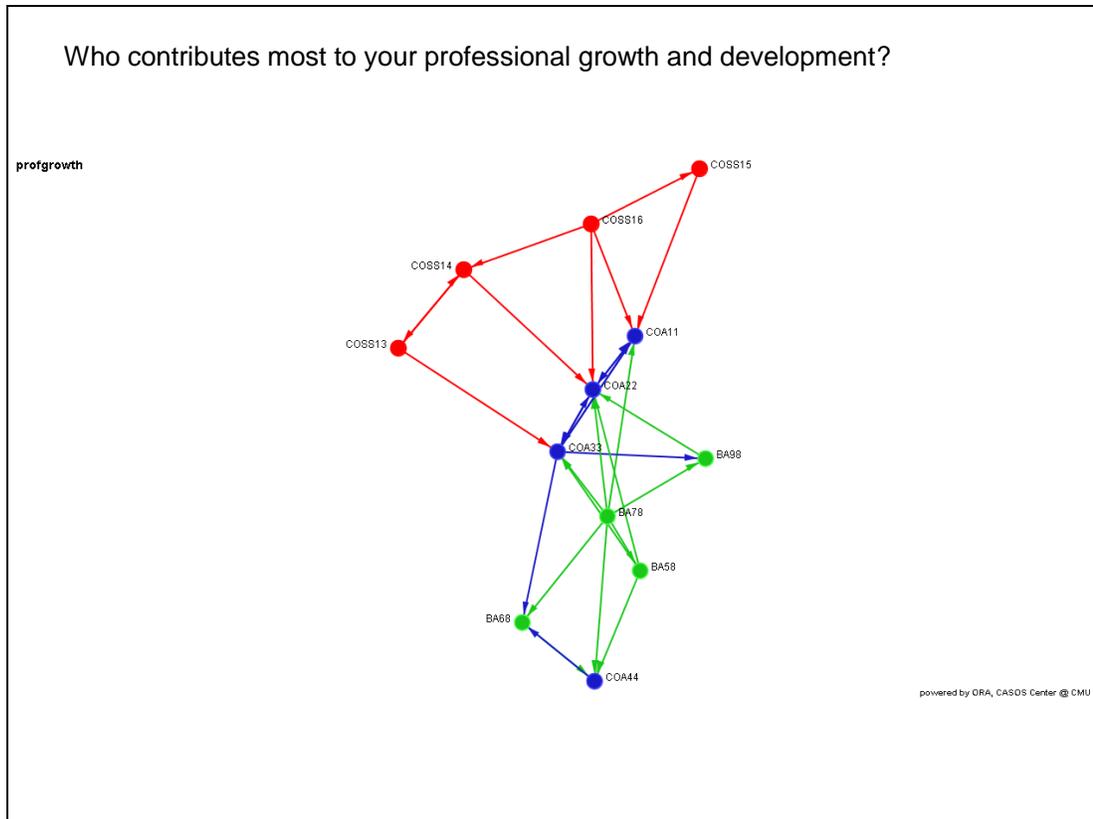
Figure 9 focuses on interactions among the staff based on who is perceived by others as entrepreneurial. The clustering within each sub-group opened up. COA22 and COA33 appeared central to the network but COA22 was characterized many two-way interactions, while COA33 only radiated out to others. BA tended to turn to each other or to COA, with three BA not perceived as entrepreneurial by any other member of the staff. For the first time, COSS were more integrated into the total network by virtue of three COSS being perceived entrepreneurial by the COA.



*Figure 9: Entrepreneurial network depicting social interactions related to fresh ways of thinking*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

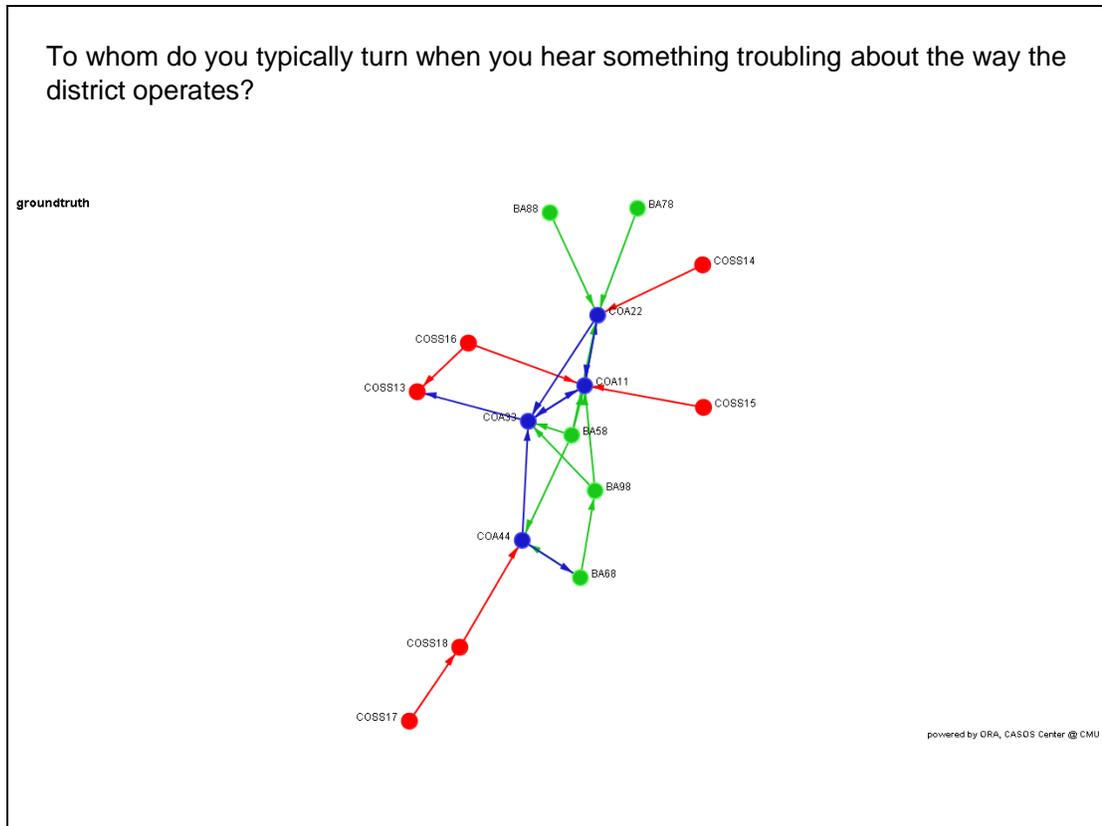
Figure 10 depicts interactions related to professional growth and development. The COA remained tightly clustered, with a few outbound interactions with BA. COA44 found growth opportunities exclusively with BA colleagues. BA turned primarily to COA but also to each other. BA78 was the most heavily networked, relying on many colleagues for professional growth. The COSS also relied heavily on COA but also on each other. Two COSS agents and one BA agent did not reply to this question, resulting in three isolated nodes (hidden).



*Figure 10:* Professional Growth network depicting social interactions related to professional development

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

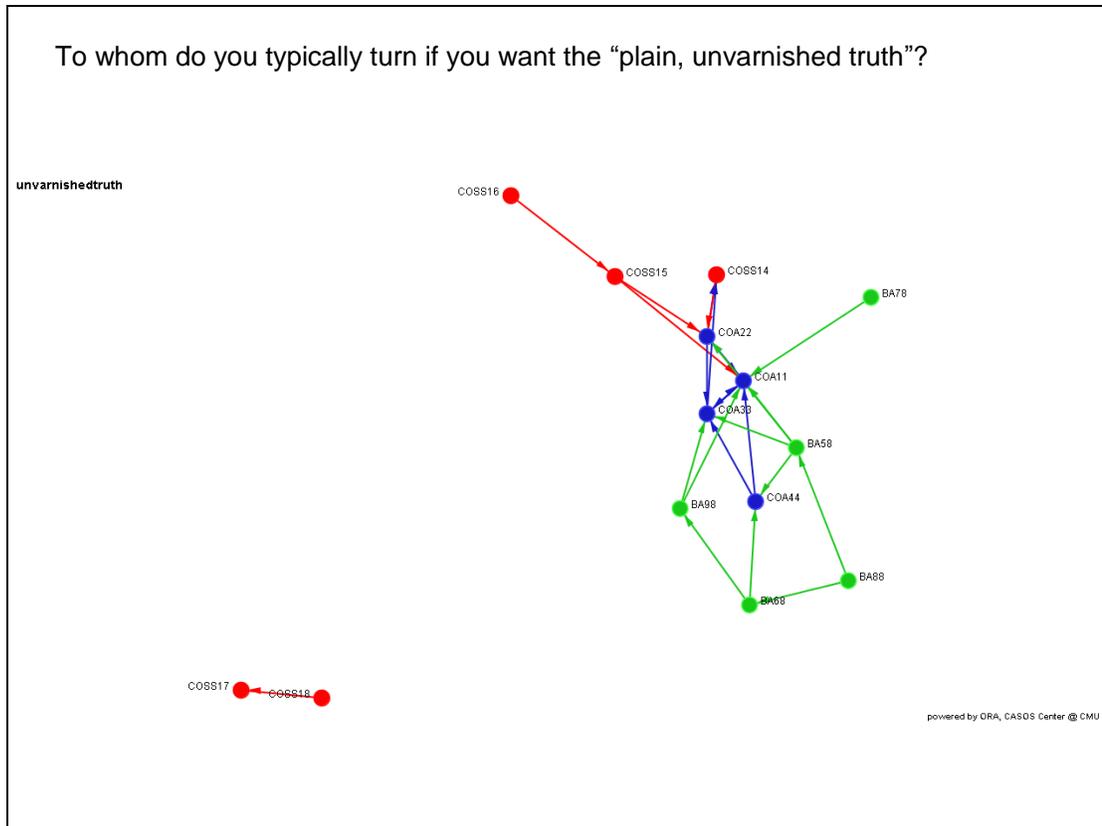
Figure 11 shows interactions that relate dealing with troubling news. Asked to whom they would turn if they heard something was amiss about the way the district operates, COA turned almost exclusively to each other with two exceptions. While BA and COSS did occasionally turn to others within their sub-groups, they predominately turned to COA, as if the COA were the only individuals able to deal with problems and troubling news. They also turned exclusively to a single COA limiting possible perspectives (for example, COSS14 turned only to COA22; COSS15 only to COA11).



*Figure 11: Ground truth network depicting social interactions related to discovering the truth behind troubling information or news*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

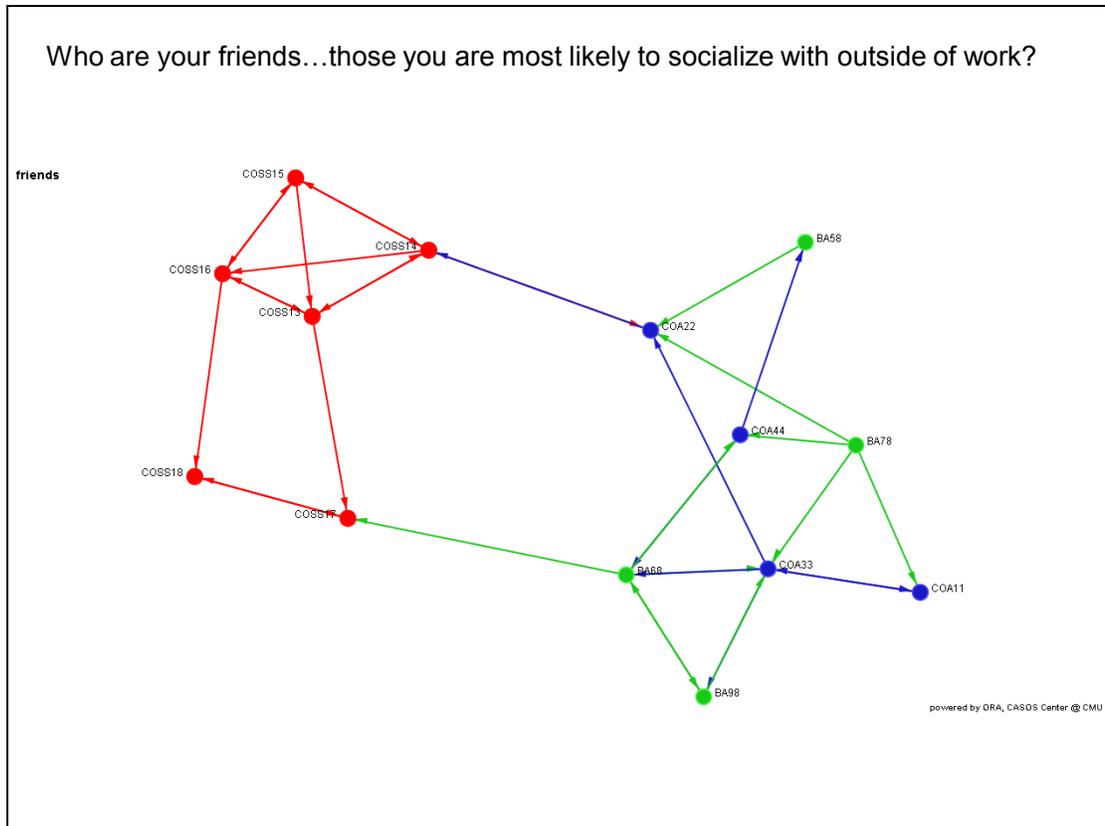
Figure 12 displays interactions based on who individuals would turn to if they wanted to hear the “plain, unvarnished” truth. The locus of these interactions were the COA, who turned almost exclusively to each other, with the exception of COA22 turning to COSS14. The BA turned to the COA and to each other, as did the COSS. COSS 17 and COSS18 were completely fragmented from the network, with COSS17 turning to no one. The number of links per person is few, with most individuals connecting to two or one other person. BA58 has the most connections with three. One COSS agent did not reply, creating a single isolated node (hidden).



*Figure 12: Unvarnished truth network depicting social interactions related to candor*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

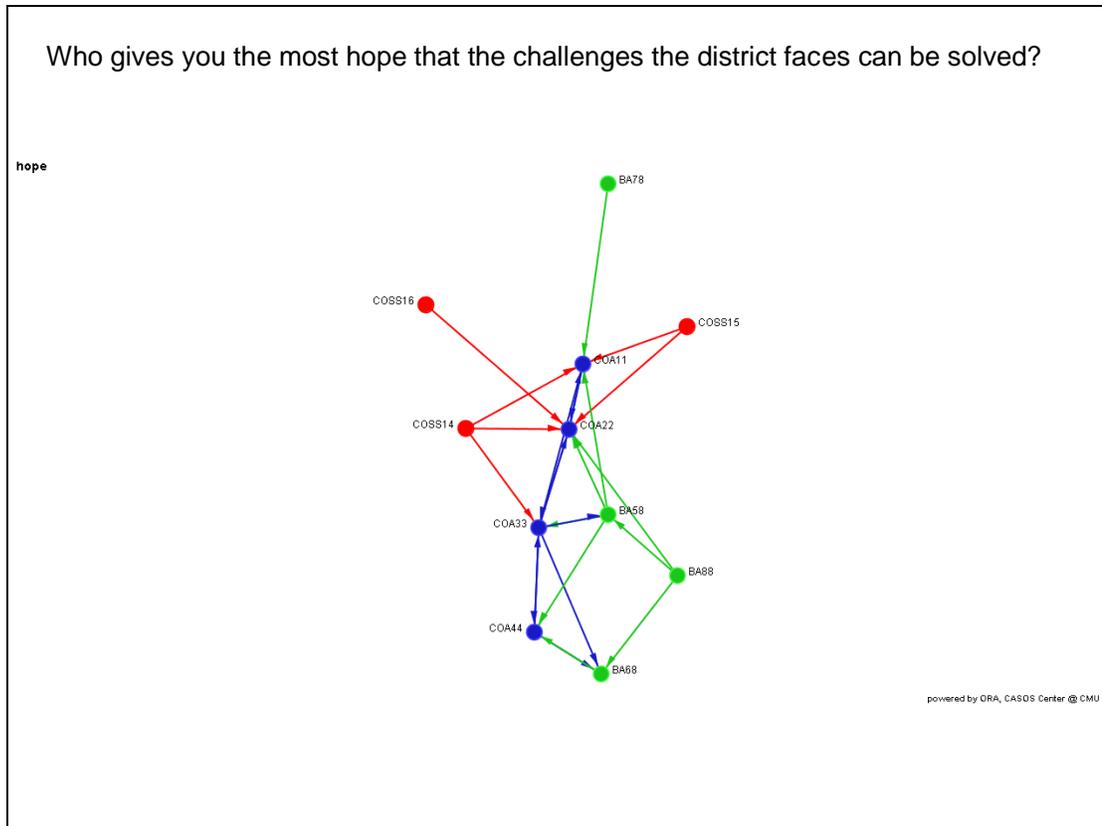
Figure 13 reveals friendship connections. The COA and BA sub-groups were more inter-connected than in previous visualizations, as if friendships created opportunities for broader connections or linkages. The COSS sub-group, however, remained largely detached, sustaining friendships within itself, with few exceptions. COA33 and COSS13 were the most inter-connected nodes within each sub-network, both in terms of outbound and inbound linkages. One BA agent did not reply, creating a single isolated node (hidden).



*Figure 13: Friends network depicting social interactions of declared friendships*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

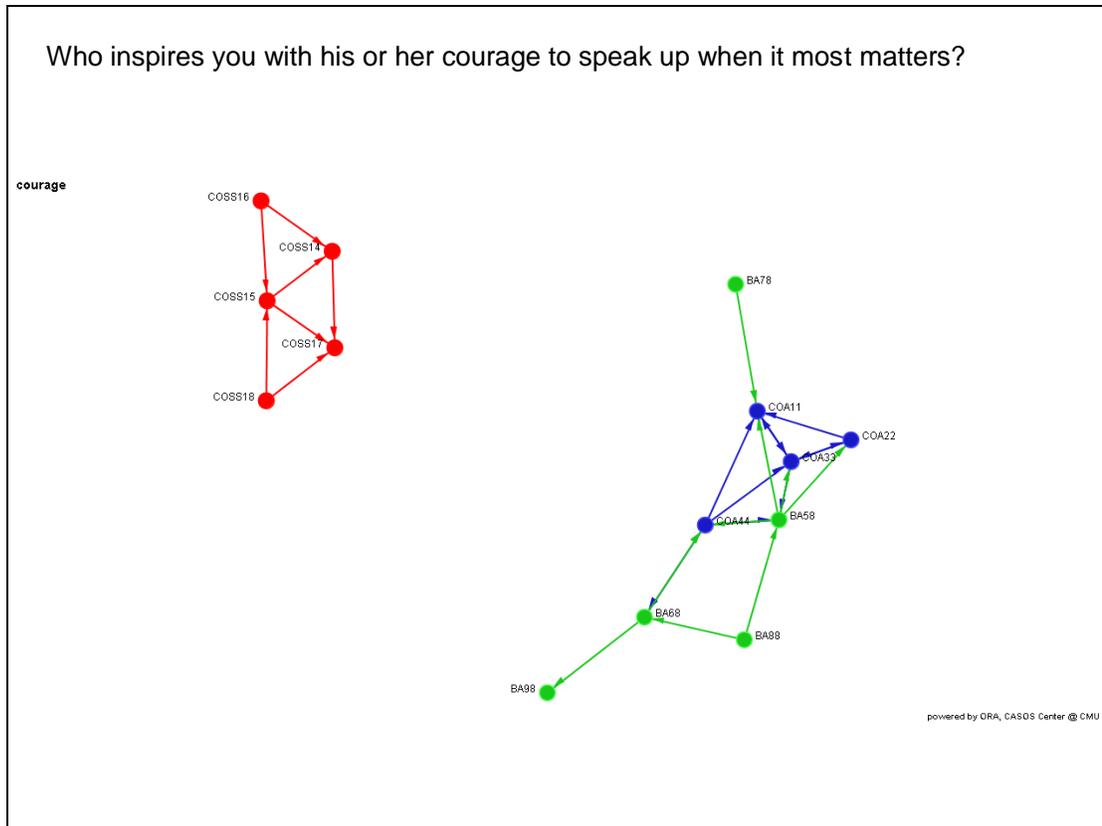
Figure 14 shows interactions centered on those who inspire courage. COA tended to turn primarily to each other or, occasionally, to BA. BA turned to each other or to the COA. Most individuals tended to turn only to a select few others. The COSS turned only to COA and were turned to by neither of the other two sub-groups. There were a high number of isolated nodes or singular nodes, that is persons who were connected to the network by only one linkage. Three COSS and one BA did not respond to this question, resulting in four isolated nodes (hidden).



*Figure 14:* Hope network depicting social interactions defined by those who inspired hope among their peers

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

Figure 15 depicts interactions based on who turns to whom for inspiration to act courageously. The COA turned largely to one another. The BA turned to one another or to the COA. The COSS turned completely to members of its own sub-group, creating complete isolation of this group from the others. With two exceptions, courage was not perceived broadly. Individuals tended to find it in two other people at most. COA33 saw courage in three other people and BA58 saw it in four. One COSS did not respond to this question, creating a single isolated node (hidden).



*Figure 15: Courage network depicting social interactions predicated on who inspired courage in others*

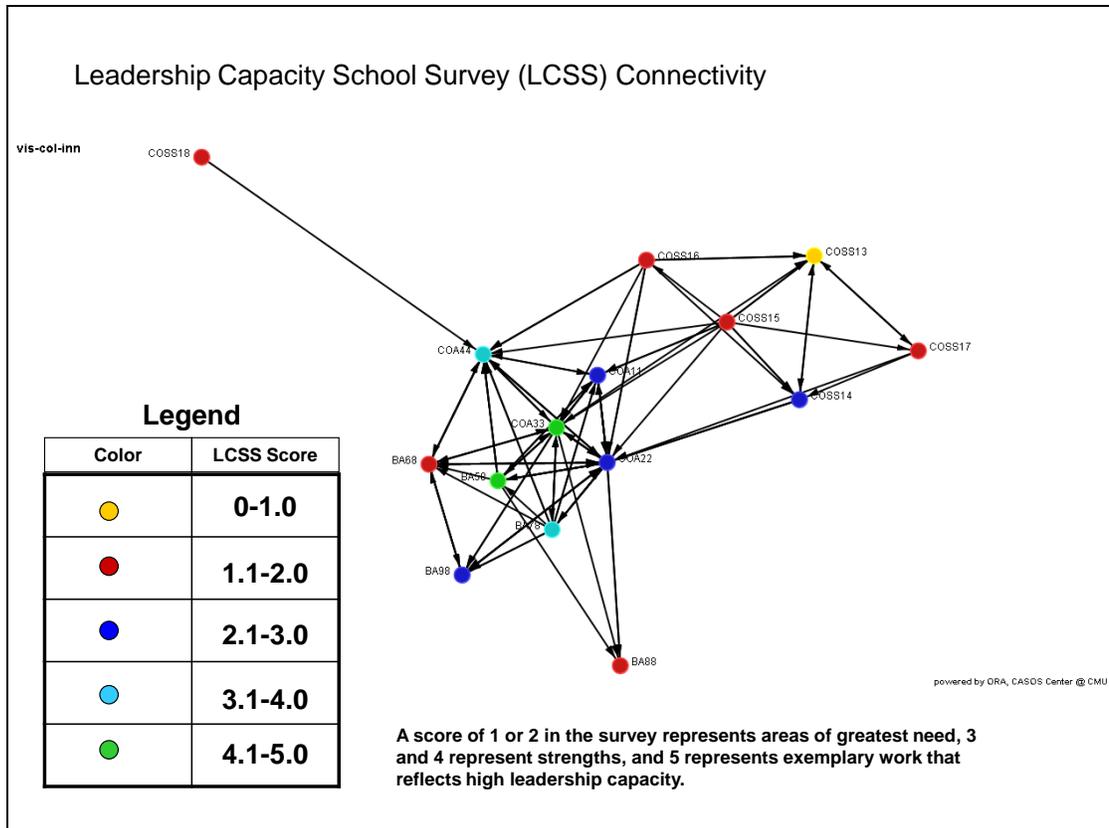
Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

Figure 16 reveals routine interactions among members of the staff network and their frequency. The busyness of this slide, the anonymized names, and the inability to view additional information only viewable within the ORA software made additional insights about this visualization difficult.



The first aspect of the visualization to note is that it represents a combination of the Vision, Collaboration, and Innovations networks (Figures 5, 6, and 7), which ORA has the capability to perform. These three networks were chosen because each correlates to a construct within the LCSS (vision = focus on vision; innovation = reflection and innovation; and collaboration = shared governance). This composite network, therefore, reveals connections that might shape leadership capacity. Because of this fact, the researcher employed it as the default network for all subsequent visualizations.

The second aspect of this visualization to note is that each node or actor has been color coded to reveal his or her score on the LCSS. The LCSS (Appendix G) seeks to measure leadership capacity within an organization. Using a scale of 1 to 5, where 1 represents “We do not do this at our organization,” 2 represents “We are starting to move in this direction, 3 represents “We are making good progress,” 4 represents “We have this condition well established,” and 5 represents “We are refining our practice in this area,” respondents scored 4 constructs: Intense Focus on Vision, Reflection and Innovation, Shared Governance, and Monitors and Responds to Staff Achievement. The implications of this visualization will be discussed along with other patterns and themes emerging from the network diagrams collectively and holistically.



*Figure 17: Relationship between Social Network Analysis of the combined Vision-Collaboration-Innovation network and results of Lambert’s Leadership Capacity School Survey*

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Note: This visualization kluges the Vision, Collaboration, and Innovation networks, as these dimensions comprise three of the critical constructs within Lambert’s (2003) LCSS.

Yet another visualization (Figure 18) dealt with how networks informed each other.

Based on consultation with Mr. Jeff Reminga (personal communication, May 21, 2009), a developer of the ORA software application, the researcher chose to visualize the relationship among the Unvarnished Truth, Think Hard, and Professional Development networks. In other words, the question might be posed as to whether someone that others turn to for the plain, unvarnished truth might also be someone others turn to for

professional development and assistance thinking through tough problems. The challenge with this visualization was its limited ability to foster meaningful discovery among the district's senior leaders because it was anonymized. While it was possible in the abstract to see that Actor A was connected to Actor B in one or all three of these dimensions, and also draw some insights about interactions among sub-groups, meaningful insights could only be drawn if Actor A knew specifically who was citing him as candid, thought-provoking, and professionally helpful. Such insights could only be realized by having the nodes identified by their actual names, and both the nature of the Informed Consent process and the expressed desires of those participating prevented such transparency.

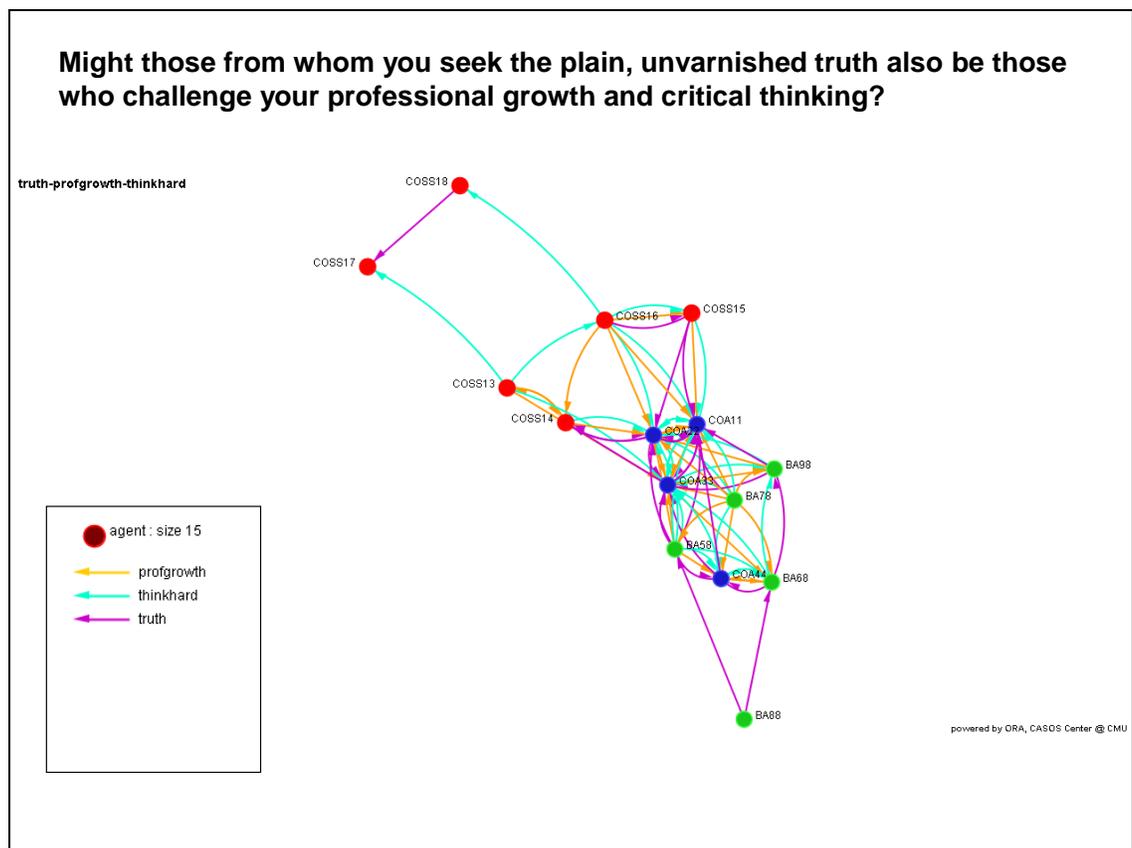


Figure 18: Combined Unvarnished Truth-Think Hard-Professional Growth networks to see how one informs the other

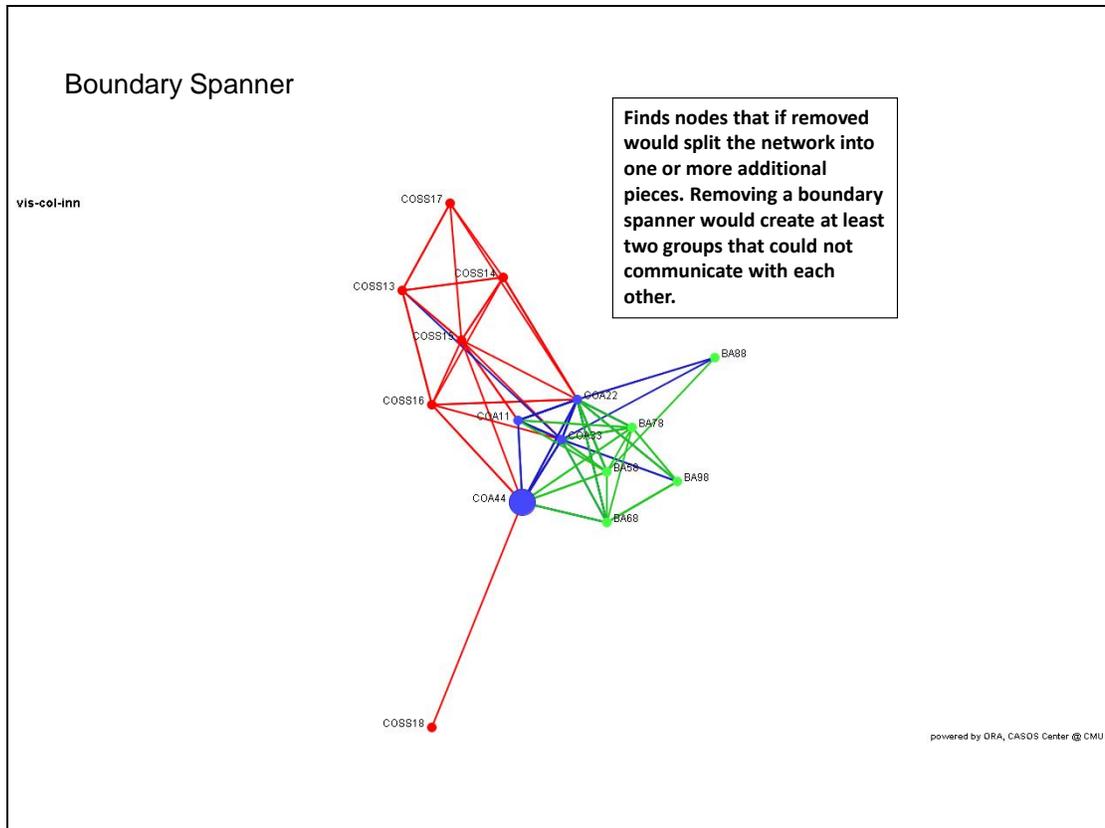
Note: COA are represented by blue dots; BA by green dots; COSS by red dots. Arrows reveal the direction of interaction.

### *Network Measures*

While network visualizations can reveal who is connected to whom, they cannot always reveal with clarity the strength of those connections, or how central a person is to the network, or how far one actor is from another (within the typography of the network map). These quantitative details help to enrich understanding of the network and inform decisions that might improve network performance (Carley, Columbus, DeReno, Reminga, & Moon, 2008; Cross & Parker, 2004; Krebs, 1996, 2008).

ORA has the capacity to calculate and visualize over 100 such measures (Carley, Columbus, DeReno, Reminga, & Moon, 2008). In the following visualizations (Figures 19 through 26), the most frequently employed measures are revealed with a dialog box explaining each. These specific measures were chosen in consultation with Mr. Jeff Reminga (personal communication, May 21, 2009) who also authored the boxed definitions.

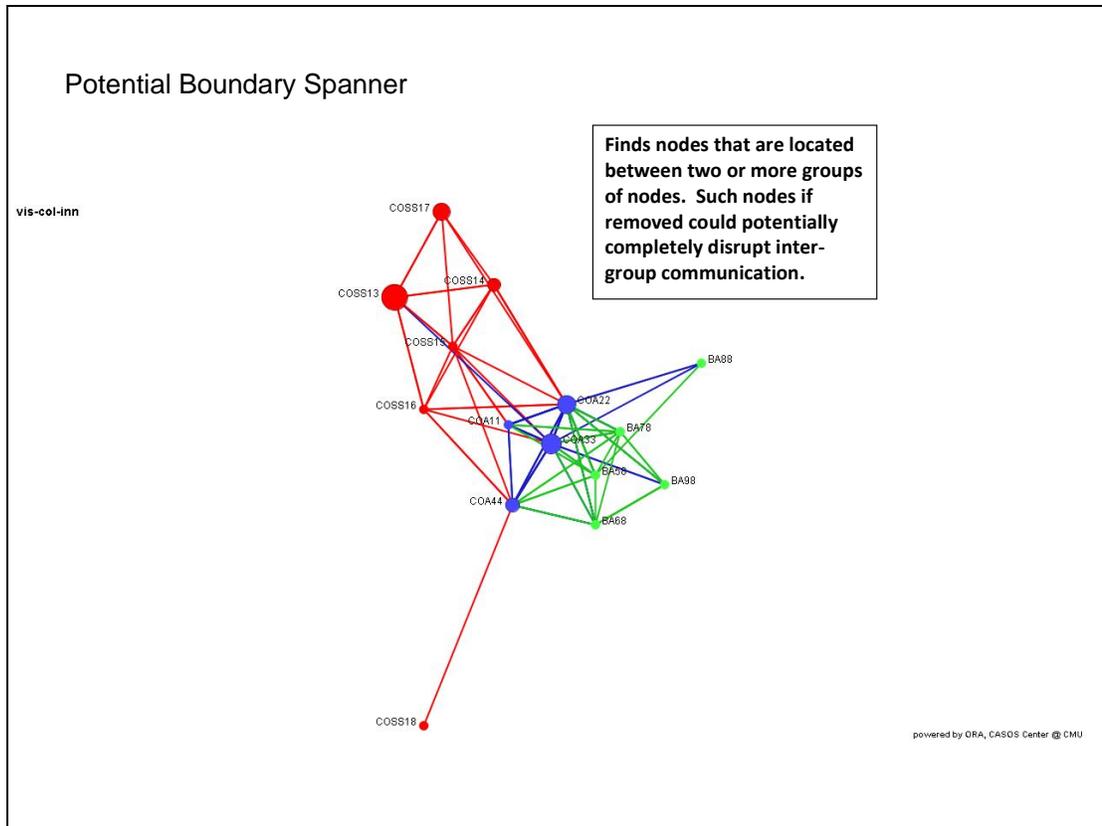
Figure 19 depicts the Boundary Spanner measure, which indicates that node, if removed, would fracture the network into one or more sub-networks. In this instance, COA44, if removed would result in COSS18 being completely isolated from the remainder of the network. In other words, in the combined Vision, Collaboration, and Innovation network, COSS18 connected to the network only through COA44.



*Figure 19: Boundary spanner*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots.

Figure 20 depicts the Potential Boundary Spanner measure, which reflects those nodes that are located between two or more groups of nodes. The size of the dot or circle reflects the degree to which this node spans other sub-groups. For example, COSS13 is located between more sub-groups than are COA22, COA33, and COSS17. All four are important nodes in inter-group communication, and their removal would disrupt information flow.



*Figure 20: Potential boundary spanner*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. The size of the node reflects the degree to which this node spans sub-groups; the larger the node, the more groups spanned.

Figure 21 depicts the measure Clique Count, which identifies those nodes that are part of several clusters of nodes, or cliques. For example, COA22 is a member of 8 such cliques. COA33 and COSS15 are members of 7 cliques. These nodes facilitate communication among these nodal groups or cliques.

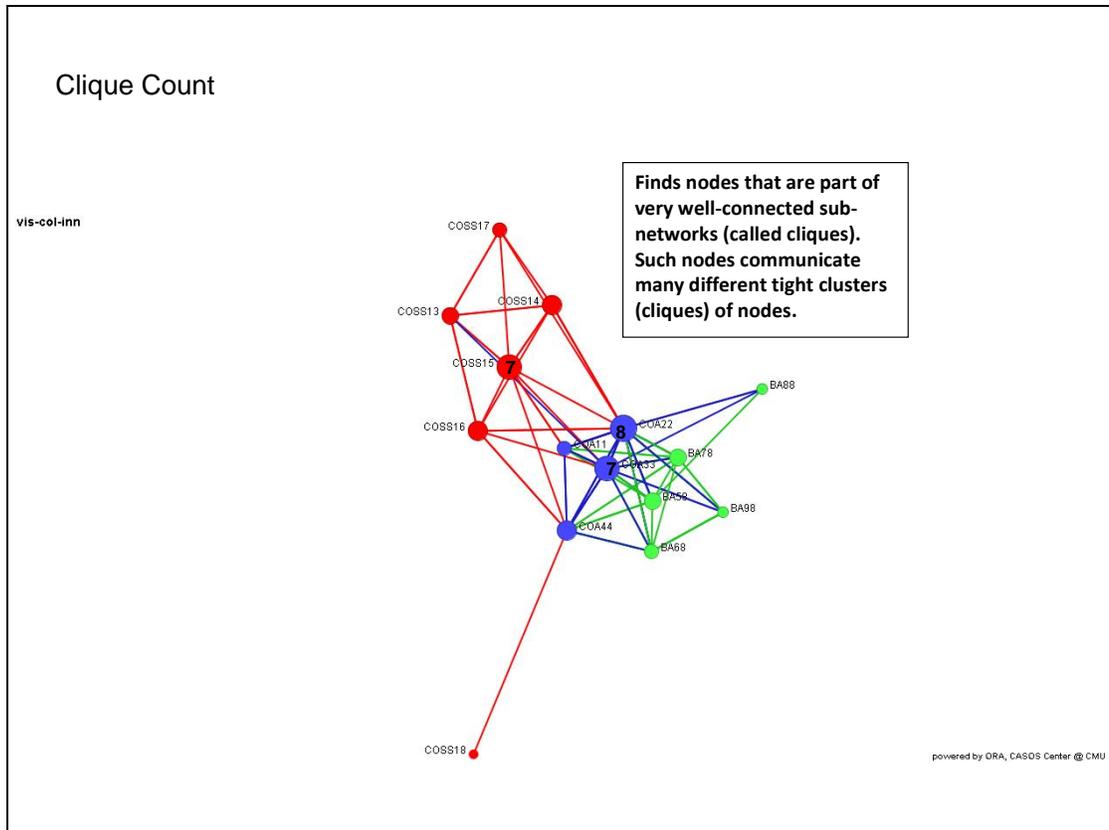
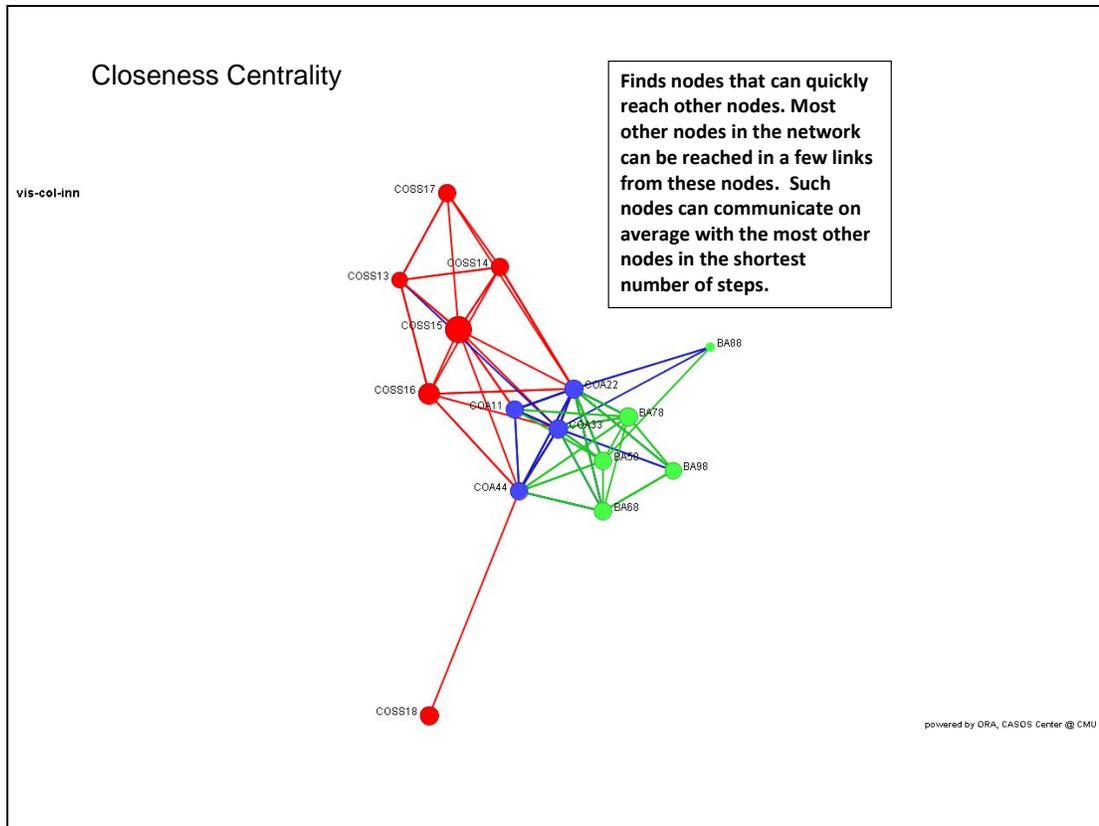


Figure 21: Clique count

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. The size of the node reflects the number of sub-networks or cliques to which that node belongs.

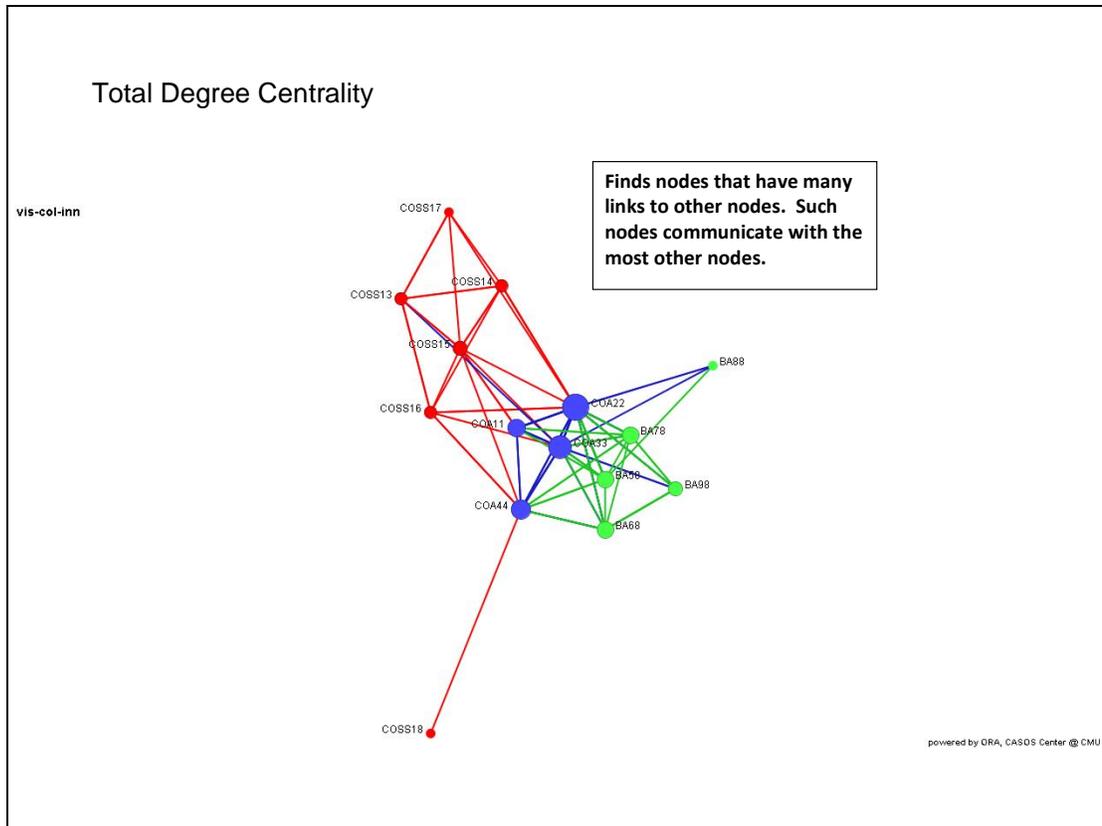
Figure 22 depicts the measure of Closeness Centrality, which assesses nodes based on their “distance” to other nodes. Nodes with higher closeness centrality are able to connect to other nodes in the network through the fewest number of steps. In this case, COSS15 has the highest closeness centrality, enabling it to link to more nodes in the network faster (in the fewest steps) than any other node.



*Figure 22: Closeness centrality*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. The larger the node, the higher the closeness centrality and the ability of that node to connect to the most other nodes fastest.

Figure 23 depicts Total Degree Centrality, a measure connectedness. Nodes with higher total degree centrality are the most connected nodes in the network, having more links to other nodes. For example, COA22 has the highest total degree centrality in the network, which means that this individual communicates with the most other nodes. COA33 is also significantly linked to other nodes.



*Figure 23: Total degree centrality*

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. The size of the node reflects the degree to which this node is linked to other nodes.

Figure 24 depicts Betweenness Centrality, which measures the degree to which a given node sits along shortest paths. The more shortest paths a given node situates itself along, the greater its ability to facilitate inter-nodal communication. COA22 not only connects to the most nodes, it also sits along more shortest paths than any other node.

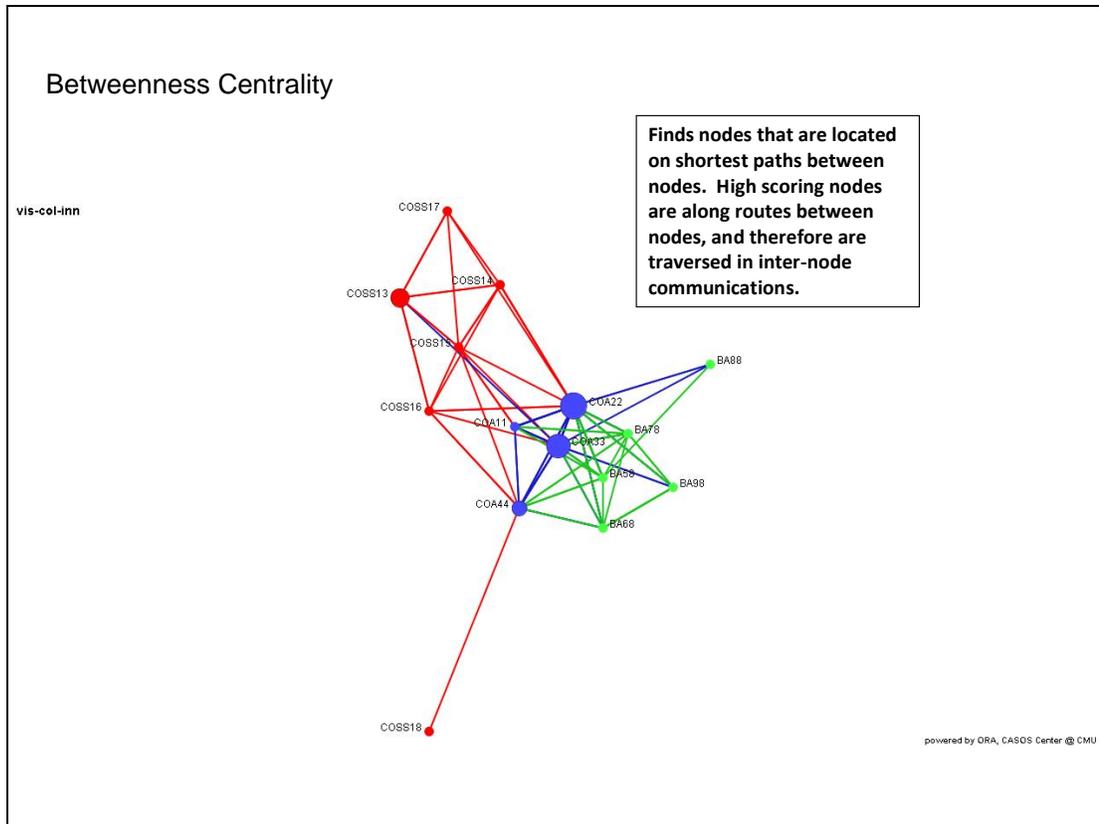


Figure 24: Betweenness centrality

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. The size of the node reflects the degree to which this node situates itself along shortest paths.

Figure 25 depicts Complete Exclusivity, a measure of a given node's connection to those nodes to which no other nodes connect. For example, COSS15 connects to the most other nodes that, without their connection to COSS15, would be completely isolated. Put another way, COSS15 becomes a critical communication lynchpin connecting these nearly-isolated nodes to the rest of the network.

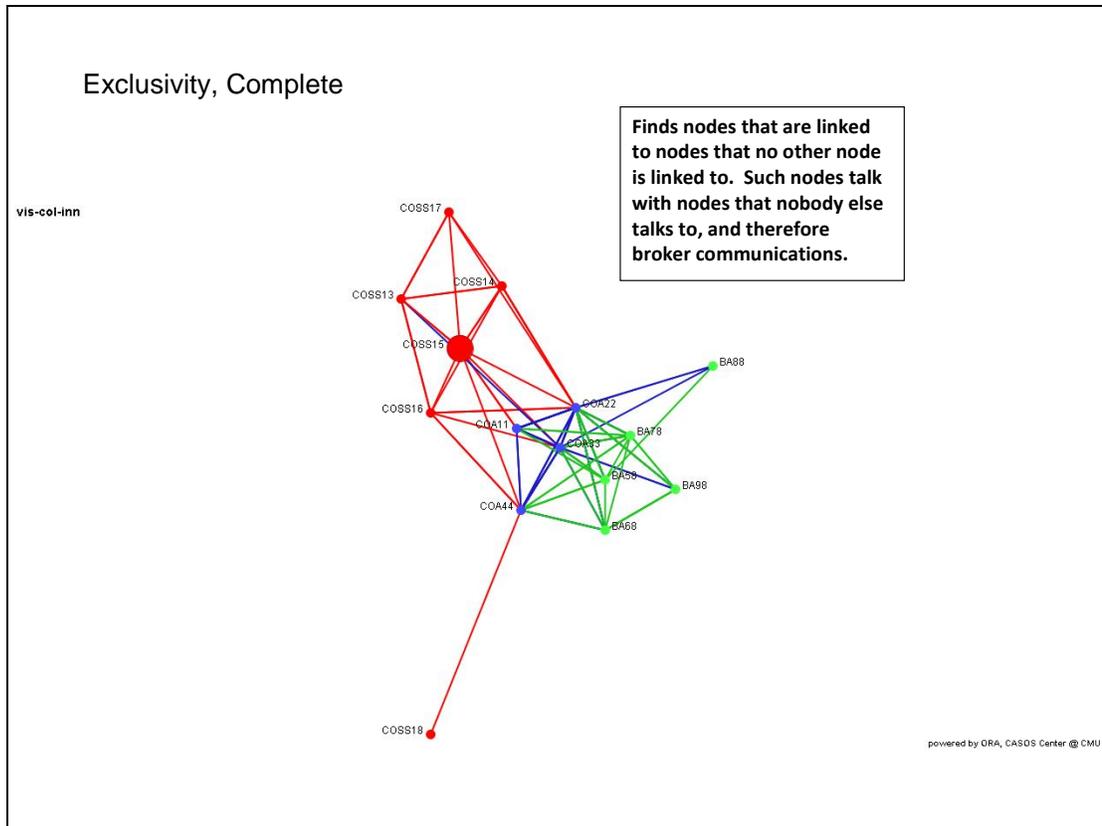


Figure 25: Complete exclusivity

Note: COA are represented by blue dots; BA by green dots; COSS by red dots. The large node reflects that node that has the most connections to nodes that would otherwise be isolated.

Figure 26 depicts the Core-Periphery measure, which identifies those nodes that have the most ties to other nodes and especially with each other. These form the core of the network, while the remaining nodes form the periphery. In this case, COSS14 and COSS18, along with BA58 form the core of the network. They have the most overall connections to other nodes. The peripheral groups have weak ties with the other peripheral groups, relying largely on the core nodes for the propagation of information. BA68 and BA78 were completely isolated from the network.

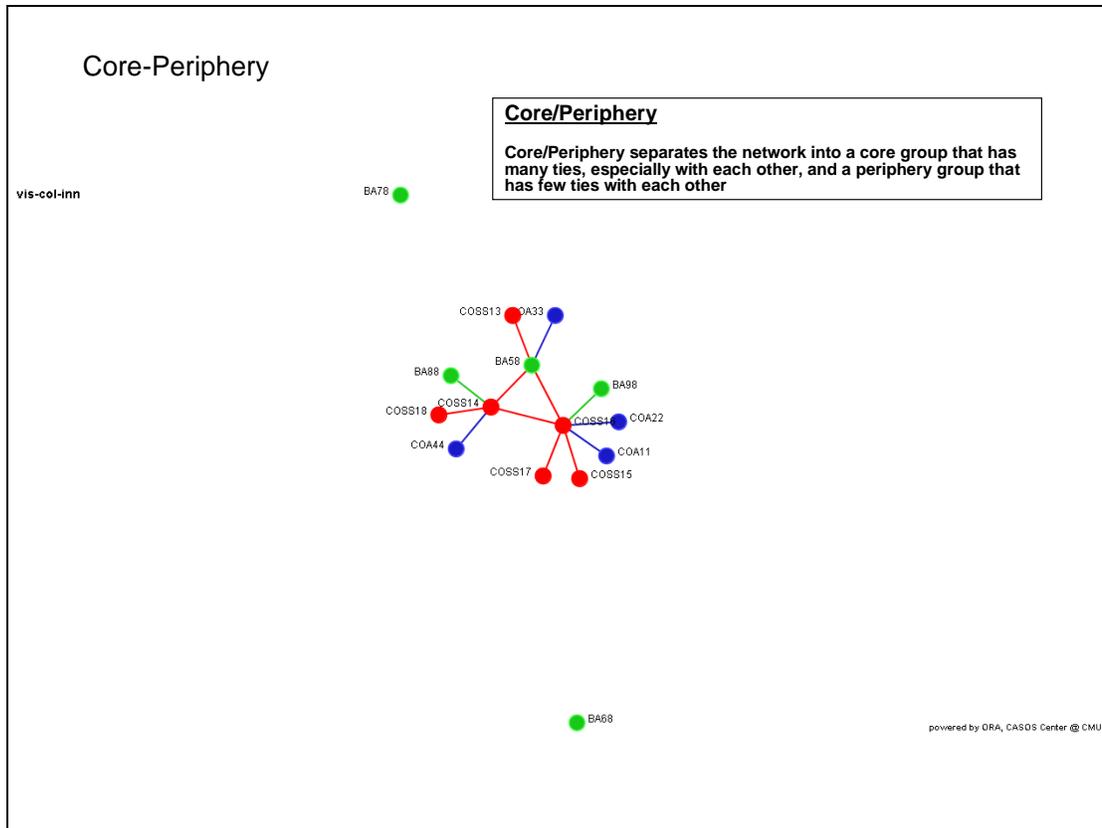


Figure 26: Core-periphery

Note: COA are represented by blue dots; BA by green dots; COSS by red dots.

### *SNA patterns and themes*

Two significant patterns or themes emerged from the network visualizations that amplified themes emerging from transcript coding and field observations. The first theme was that of *isolation* or *fragmentation*. The second theme was that of *cliquishness* that reinforced the tendency of network nodes (agents) to cluster together based on traits, position, interests, or other points of commonality, what Krebs and Holley (2006) characterized as “birds of a feather flock together” and “those close by, form a tie” (p. 4).

Although a small organization, Rivertide’s administrative team nonetheless revealed noticeable fragmentation. This fragmentation was manifested by several aspects

of the network visualizations. One of these aspects was the number of nodes (agents) that were complete isolates of the network.

Another aspect of the network visualizations that reinforced the theme of *fragmentation* was the number of agents or nodes that were connected to only one other agent or node. This fact is further reinforced by the degree of reciprocity that existed within each network. Reciprocity is a measure of whether interactions were reciprocal; for example, if Actor A indicated that Actor B was his friend, did Actor B say the same in return.

While reciprocity is certainly a function of roles and the specific nature of the interaction under analysis, the higher the degree of reciprocity, the greater the likelihood that density, which is a measure of the number of ties that exist among agents compared with the total number of ties possible, will also increase. Overly dense networks can lead to rigidity but high density means that network connections are optimized, facilitating communication flow (Krebs & Holley, 2006). Table 3 summarizes the number of isolates, single connections, reciprocity, and density for each network.

Table 3

*Network measures that reveal network fragmentation and isolation*

<b>Network</b>	<b>Isolates</b>	<b>Singles</b>	<b>Reciprocity</b>	<b>Density</b>
Vision	0	4	0.26	0.18
Collaboration	1	2	0.34	0.2
Innovation	2	2	0.25	0.14
Think Hard	1	4	0.11	0.14
Entrapreneurial	0	5	0.07	0.13
Prof. Growth	3	3	0.2	0.14
Ground Truth	0	7	0.14	0.11
Unvarnished Truth	1	7	0.13	0.11
Friends	1	4	0.47	0.16
Hope	4	6	0.25	0.11
Courage	1	6	0.25	0.12

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Note: *Isolates* are the number of nodes that have no tie or connection to the network. *Singles* are the number of nodes connected to the network by only a single tie. *Reciprocity* is the percentage of ties A to B that are also B to A, with 1.0 representing complete reciprocity among all interactions. *Density* is the percentage of actual ties to all possible ties.

The second network visualization theme is the degree to which nodes or agents cluster together based primarily on job function or proximity within the organization. Repeatedly in the network diagrams, members of the three identified sub-groups (central office administrators, central office supporting staff, and building administrators) tended to interact chiefly with their own kind. This fact was both by choice and driven by the nature of the specific interaction. In the Vision network, for example, there was a high degree of clustering around the central office administrators, from which vision is expected to emanate. The same held true in the Ground Truth network. In networks such as the Friends network and Courage network, there was a very clear clustering by sub-

group. In general, central office administrators referred to other central office administrators or building administrators; building administrators tended to interact with each other, reaching out to the other sub-groups as necessary; and the supporting staff turned largely to each other except when necessity caused them to turn to the central office administrators.

### *Integrating Themes*

Woven among the network visualizations, interview transcripts, and field observations were four inter-related themes, depicted in Figure 27. Each amplifies and informs the other.

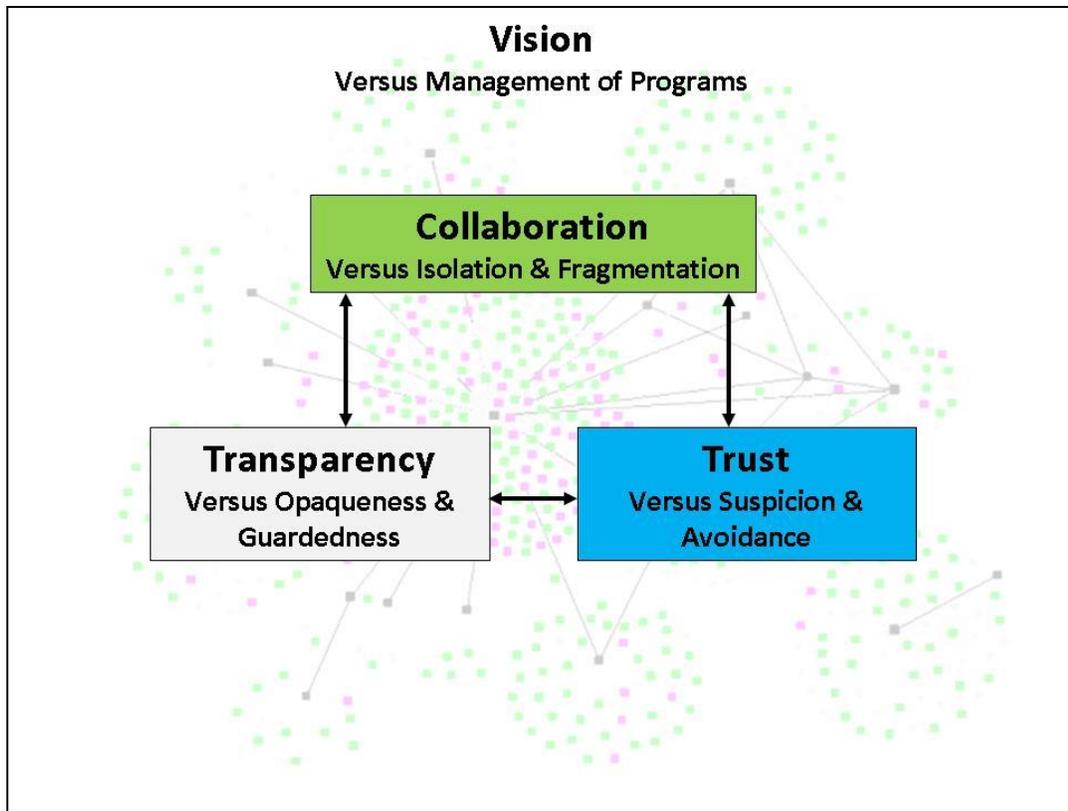


Figure 27: Integrating themes

### *Vision*

When asked what kind of leadership was needed to deal with today’s complex educational environment, a central office administrator (COA) stated, “One that is consistent in message.” Within Rivertide School District, one of the chief challenges was its lack of consistent vision, which was driven by both confusion as to what vision is (during the final senior administrators interview, no one could state the district’s vision with precision) and, simultaneously, a plurality of visions. Not only does the district have a form of vision statement, but each of its schools has one, from simple one-line statements such as, “Success for All, Whatever it Takes,” to multi-part vision statements a page long.

On the one hand, participants seemed to believe that vision was something overarching and unifying, as evidenced by these statements from two building administrators (BA):

(BA1) I think we require a form of transformational leadership. The leader needs to be able to form a clear vision of where we need to go, and be able to get the staff to buy into that vision.

(BA2) Leaders [as opposed to managers]...clearly have created a vision for the building or district and nearly all decisions reflect that vision.

On the other hand, participants wanted precise and clear guidance, as BA3 stated: “There is also a critical lack of communication from the top down in our district. Expectations are [informally] communicated, and when they are followed people still get in trouble because they didn’t follow something else that was not stated.”

The school’s Comprehensive School Improvement Plan (CSIP) for 2007-2012 does not use the term vision. Instead, it lists 12 belief statements, a mission statement and five goals. The mission statement reads, “Working together to help all children learn” (although on one of the building websites, the district’s mission reads, “Leading with excellence, the Rivertide School District, in partnership with parents and community, will provide a safe, orderly, and healthy environment while educating all students to their maximum potential and inspiring them to be responsible lifelong learners and citizens who can master and appreciate the challenges of a changing world.” In fact, there was an admission during the senior leaders interview to review the SNA results that it was the old, not the new, vision that was still posted around the district. Central to Rivertide

School District is its adoption of Professional Learning Communities (PLCs) as a means of “working together” better. Some viewed PLCs as akin to vision; others as a program:

(BA3) Becoming a Professional Learning Community is supposed to be the glue that holds all of our work together and the means by which our student achievement will improve, yet I believe it would be safe to say that central office administrators and other building administrators do not know what happens in each building to create this Professional Learning Community.

If merely a program, then PLC failed to provide the glue that vision was meant to provide. According to BA2, there is a correlation between vision and leadership. Leaders take “stock of the culture and create a vision based on all-inclusive communication; continued improvement is a necessity.” BA2 differentiated between leaders and managers.

Administrators have always been seen as bosses in nearly all school districts, including this one. They manage the money, make the decisions about the district and building direction. Administrators are not seen as part of the overall district team, but as faceless managers consumed with successful test scores or the bottom line....Managers use checklists and follow a prescription on research-based instruction or programs. Their quest is to make everyone in the district or building adhere to these programs regardless of the strengths or weaknesses of individuals or buildings. Building trust is not a priority; results are paramount.

As BA2 also noted, there is a correlation between vision and trust. In BA2’s view, vision unifies action but does not dictate that action. It provides left and right limits but otherwise allows organizational members latitude to operate within those limits.

What became evident was that vision affected everything. While there was inconsistency in defining and applying it, there was no inconsistency in recognizing its importance, first in terms of fostering effective collaboration (all rowing together) and second in terms of enabling an environment of greater trust.

Seen through the lens of SNA, there appeared to be a high reliance on the central office administrators for matters related to the district's vision. When asked who the keeper of the vision was, the senior administrators agreed it was the superintendent. Yet a few voices in the group, such as BA2, recognized that everyone has a role in the district's vision:

At the same time, it should be all of us really. The leader has to keep the vision alive. The leader is the one espousing the vision of where everything goes and what it revolves around. That person is really the caretaker who makes certain everybody else knows what the vision is, where the district is going, and how the district is going to get where it needs to get. My opinion, that's what the leadership responsibility is for the person at the top.

Interestingly, in the ORA Vision network (Figure 5), the fact that most people turned toward the COA for help in understanding and implementing the district's vision and mission was seen as less a sign of the central office's leadership role than as a sign of confusion. If everyone understood the vision and exuded it in their daily activities, then they might not be so reliant on the central office, as BA3 points out:

If we agree that we're all responsible for knowing [the vision] and understanding it...I agree that the superintendent champions it...if we're all a bit uncertain of what it is, then we're going to tend to go to the central office to know what it is.

But if we all know what it is, we can reach out to each other for help; I'm going to go to those people I work with most often to get that information.

### *Collaboration*

The district's adoption of Professional Learning Communities and expressed mission of "working together" speak to its commitment to shared ways of working and learning. This overt commitment to collaboration seeks to overcome a perceived weakness within the district. In its CSIP the district listed as a strength "commitment to professional development and progressive programs (dedication to improvement)" while it listed as concerns "collaboration opportunities" and "communications."

When asked what the toughest, most complex problems facing the district were, BA4 stated, "For my building, the most complex problem is getting teachers to accept ownership for developing a collaborative culture." He cited as root causes

Teachers that have worked in isolation for many years, teachers being uncomfortable sharing real student data and taking ownership of that data, teachers understanding the need to discuss grade level data, and time constraints for sustained collaboration.

What BA4 made evident was that isolation was both self- as well as organizationally-imposed. As an offsetting mechanism, collaboration required individuals to reach beyond themselves while simultaneously being reached to by the organization. This belief was reinforced by COA2, who felt that "acceptance of the responsibility for involvement and collaboration" was an essential skill for the district. It was "important because all stakeholders must value the need for collaboration and acknowledge the benefits for student learning."

The superintendent saw collaboration as a necessity borne from historical experience.

When I started as a principal 25 years ago and as a superintendent 20 years ago, we were viewed as the boss. What we said went. It was our job to tell the teachers what to do, and it was their jobs to do what we told them. And I think what we found is that this was not a very powerful way to improve instruction. The collaborative part of teachers working together to find a common solution is really powerful...a lot more powerful tool than a principal telling them how to do it.

Another building administrator felt that while there was an external commitment to PLCs and collaboration, there was often disconnect between theory and practice. BA3 often felt that while the central office advocated that BAs create collaborative environments within their buildings, and held them accountable for being fully present and engaged with their staffs, the COA sub-group did not always practice what it preached. “There is a lot of talk about how we work together and are getting on the same page, yet it is quite superficial.” This building administrator went on to say: “We need our leadership to know what is happening in our buildings and be able to talk about and understand the various issues and needs of individual buildings. We need our leadership to model the behavior they want others to emulate.”

When viewed through the ORA network visualizer, several insights emerged concerning collaboration, often by noticing its absence or impairment. Among many of the network visualizations viewed and discussed by the senior administrators, there appeared a consistent pattern of sub-groups interacting largely within themselves. There was also clear isolation of individuals and fragmentation between and among sub-groups.

This fact was most obvious with the COSS subgroup comprised of central office administrative assistants.

As one COA questioned aloud, “Would it surprise you to know that the support staff is dysfunctional?” There was broad agreement with this assessment and an overt resignation to its unchangeableness, which appeared to prevent or stall efforts to bridge divides, as evidenced by the superintendent himself: “Most of the support staff have been here for many years. How do you ever deal with a problem with people that have been here so long?” In essence, his complaint was that the support staff seemed locked in old ways of doing things; yet by their own admission, the support staff made clear through the SNA survey results that it was not engaged by the other sub-groups in meaningful ways; thus, its members turned to each other for support. This isolation was most evident in the Courage network (Fig. 15). Upon seeing this network visualization, COA3 remarked, “It means they’re scared to death to talk to us,” to which COA4 replied, “Or we’re not inspiring them.”

There was clear recognition the support staff remains vital to the overall performance of the district, a fact made clear by BA5, who said, “The longer I’ve been here, the more I interact with the support staff.” This recognition was realized at the start of the senior leader interview, when it was asked to draw general observations about the networks they had just witnessed (the researcher scrolled through the 12 networks quickly, then returned to examine each one in greater detail). COA2 said: “One of the things I noticed was on the one [network] about vision. I found it interesting that our support staff wasn’t really involved in that one. I remember when [my assistant] was answering [his survey]. He asked what our vision was.” BA4 chimed in that all support

staff, even building secretaries would say the same thing. COA2 replied, “I don’t think it should be that way. Everyone should know.” This exchange prompted the superintendent to ask, “Do we do a good job of trying to get our support staff involved?” to which the consensus was “no.”

There appeared to be the realization that a strong connection exists between collaboration and vision, as evidenced by the following statements:

COA3: When we have administrator meetings, we’re collaborating. Every time we meet we’re collaborating about something that supports the vision and mission. We don’t sit in every meeting and talk about the vision and mission but everything we talk about supports them. In effect, we may not talk about mission and vision but we’re talking about stuff that supports them every time we meet.

COA2: Here’s what I talk about in PLC. When we send out those surveys to staff, the same things come up. Many teachers didn’t understand the question [about vision]. I put back to you, why don’t they understand the questions. If we’re not constantly thinking about the question, then we do have some disconnect and that’s what everybody needs to think about. Should we not all understand that the things we do are connected [to vision]?

The upshot of these insights is that collaboration is deemed essential to advancing the district’s vision, mission and goals, yet remains hampered by fragmentation among sub-groups and individuals. One possible source of this anti-collaboration is the lack of trust.

## *Trust*

The challenge with exploring matters of trust is that when suspicion exists to any degree within an organization, it becomes difficult to address trust directly. The researcher could not, for example, have created a Trust network by asking “Who do you trust?” on the SNA survey because it would imply that those left unchecked are untrustworthy. Such an implication may not be in concert with the fact that unchecked names reflect those who are simply unknown to others and, therefore, respondents cannot form an adequate assessment of their trustworthiness. Still, the situation raised concerns about trust that the superintendent wished to avoid in the first place when he sought care in the way the researcher conducted certain aspects of the study.

These concerns about trust were given explicit voice by BA2: “The district has and will for some time face trust issues between the central office and the teaching staff. These issues did not begin with the present administration and have gotten better over the last few years.” BA2 is the same administrator who saw the need to differentiate between leaders and managers. The latter, he argued, are most interested in results, even at the expense of trust. Leaders, on the other hand, recognize that meaningful results can only arise from cultures of trust:

Today’s educational leaders must be cognizant of the district and building cultures. Taking stock of the cultures, the leader creates a vision based on all-inclusive communication and continued improvement....This involves a review of data and an assessment of the trust and consistency of all involved parties from the students and their parents, certified and non-certified staff, all the way up to the administrators at the highest levels.

What BA2 argued is that trust must be cultivated at all levels and include everyone. Here a paradox arose for the district. The superintendent expressed concerns about trust and, while he welcomed this study, he also cautioned the researcher to avoid anything that might create undue tension, defensiveness, or resentment among the staff. His caution revealed a widespread tendency to avoid confronting the problem, which only allowed it to persist. In turn, caution seemed to lead to detachment by the central office from the challenges being faced at the building level. Rather than actively cultivate trust or other mechanisms that would enhance performance, the central office tended to push down more programs and expect the BAs to implement them. Said BA3:

We (building level administrators) are expected to be gathering data, in classrooms observing the work of our teachers, knowing what is happening in classrooms, providing professional development to our staff, engaging our staff in best practice discussions, keeping current on the professional literature, and leading our staff through that literature when appropriate, among many other responsibilities. Our district leadership is not doing the same work with building level administrators.

This detachment or avoidance was reinforced by the network visualizations, not only in what the diagrams revealed but also how they were presented (using anonymized names and limiting post-ORA analysis interview participation).

Examining such network visualizations as Vision, Collaboration, Innovation, Think Hard, and Unvarnished Truth (Figures 5, 6, 7, 8, and 12), the COA sub-group, comprised of the superintendent, deputy superintendent and two assistant superintendents consistently turn to each other on a range of issues, a pattern that COA1 recognized

during the senior leader's interview. While such self-referential interaction can be expected among this sub-group, it can also create the perception of isolation, dispassion, or distrust in the form of, "I can only get what I need from my direct or proximate peers," leading other sub-groups, such as building administrators, to feel as BA3 does, under-led or guided. Employing Lencioni's definition of trust as a willingness to be vulnerable to others (2002, p.195), detachment or inhibited collaboration could be viewed as avoidance of this vulnerability.

At the same time, the tendency of the COSS sub-group to be highly clustered within itself might also speak to a perception that it cannot reach out to the other sub-groups except when dealing with matters in which the formal hierarchy is operative, such as in the case of vision. Because this sub-group was not included in the post-ORA analysis interview held with senior administrators, they were not able to explain their seeming fragmentation from the other sub-groups, creating a form of Catch-22. Overcoming this fragmentation requires sufficient trust to invite them to the table; based on self-admission by the senior leaders, such an invitation was not likely to be extended.

### *Transparency*

Related to trust, transparency is the willingness to be vulnerable enough to allow the organization's ways of working to be exposed to external scrutiny and, if necessary, assistance. The district welcomed the use of SNA to examine social interactions among the administrative team and, in so doing, accepted willingness to be more transparent; but there were limits on how far such transparency went.

After creating the ORA visualizations, in which the names were anonymized, the researcher corresponded with the superintendent his belief that the upcoming interview

with senior administrators would benefit from transparency in the labeling of the nodes (that is, label each node with the actual name it represented). One of the chief benefits of the ORA visualizations is the ability for an individual to see exactly where he or she is, to whom he or she is connected, and who, in turn, connects to him or her (Reminga, personal communication, May 21, 2009). The researcher offered to reach out to each participant and ask their permission to ensure he or she was comfortable with such transparency. The superintendent replied with worry that such revelations would cause problems and asked that the names be kept anonymous.

During the senior administrators interview, after a number of them mentioned that it would be helpful to know who was who on the network diagrams, the researcher posed the question directly, “What value would such knowledge bring in terms of helping you better understand the strengths and weaknesses of the network? To this COA1 said, “It helps to know what other’s perceptions are of you. I know how I filled out the survey but I don’t know how others filled it out with regard to me. It would be helpful to know how others ‘see’ you.” This reply prompted the superintendent to confess that in consultation with the researcher, he had asked that names be kept anonymous:

I worry less about having the names on [the visualizations] for this group here than I could for the rest, because we’ve had enough honest conversation amongst ourselves that we know, we’re pretty open, although not as open as we could be. But the “reds” [referring to the COSS sub-group], if the reds were here, I could see challenges. I’m not saying they’re not good employees, they are. But with them here, given the nature of what’s revealed here, it could cause some really hard feelings. It could even hurt feelings among this group.

His conclusion that hurt feelings were not worth the risk reinforced BA2's admission that "the district has and will for some time face trust issues between the central office and the teaching staff." Although the present administration had made strides to overcome these trust issues, sufficient uncertainty remained to prevent members of the district's administrative team feeling comfortable enough to be both vulnerable and transparent. This, in turn, constrained full collaboration and thwarted a strongly unified vision.

#### *Research Questions: Analysis of Data*

This study involved three research phases. In the first, the researcher interviewed the Rivertide School District superintendent face-to-face in order to get not only first-hand testimony but also to immerse himself in the milieu of the district (Appendix E). As part of this phase, the researcher also emailed the same set of questions to the other senior members of the administrative team, including the deputy and assistant superintendents and building principals. In the second phase of the study, participants (N=15), which now included the central office support staff, completed both the SNA survey (Appendix F) and the LCSS (Appendix G). Results of these surveys were tabulated and those from the SNA survey were entered into the Organizational Risk Analyzer (ORA) software in order to produce a series of network visualizations and measures that were presented in the final phase of the study. This phase involved a taped interview with the senior leaders of the administrative team, which comprised the Central Office Administrators (COA) and Building Administrators (BA) sub-groups.

From these data sources, patterns and themes emerged, discussed in the previous two sections, which enabled the researcher to return to and answer the questions underpinning the study.

*Q1: What does SNA reveal about the nature of leadership capacity within the administrative team of a district central office?*

According to Lambert (2003), leadership is an act of reciprocal, collaborative learning. Examined through 12 different networks (or 12 different snapshots or lenses of the organization), leadership was impaired by isolation, fragmentation, and one-way interactions that limited reciprocity. Indeed, reciprocity within the combined Vision-Collaboration-Innovation network (Figure 17) was 36% (and for most of the individual networks hovered at 25% or less). Leadership capacity, by Lambert's definition, is simultaneously broad-based and skillful. But the SNA measure of network density, which is the percentage of reported connections to the total possible, was 30% for the combined Vision-Collaboration-Innovation network, suggesting that participation was not as broad-based as it could be.

The SNA data reinforced BA3's complaint that "there is a lot of talk about how we work together and are getting on the same page, yet it is quite superficial." That is, the COA sub-group tended to feel that it was fostering collaboration and meaningful dialog but, as the network visualizations revealed, the total administrative team remained fragmented largely along sub-group lines. According to BA3, there appeared the belief that periodic leader meetings made up for not being more present, either physically in the school buildings or metaphysically in terms of a strongly unified district vision.

The sense that team members felt truly isolated from the work of the district was reflected in a statement written by a member of the COSS sub-group on his LCSS instrument:

As a support staff member, I am not a part of the above [referring to the four leadership capacity constructs that comprise the LCSS]. At central office the above areas [intense focus on vision, reflection and innovation, shared governance, and monitors and responds to staff achievement] tend to be discussed by the administration only.

One way to assess the ways in which SNA informs leadership capacity is to reflect on the qualities and actions that Lambert (2003) said characterize districts that exhibit high capacity. A comparison of the SNA results to these qualities and actions offers an effective means of self-assessment, reinforcing the value that SNA brings to uncovering both strengths and weaknesses within an organization.

Lambert (2003) enumerated a number of superintendent leadership acts meant to foster leadership capacity within his or her district (each is quoted verbatim):

- 1) Insisting that the community **convene around** the development of a **shared vision**
- 2) Demanding that tough questions be raised and problems **resolved together**
- 3) Allowing for solutions to arise out of **shared dialogue** and not necessarily preconceived outcomes
- 4) Maintaining focus on a **shared vision**

- 5) Establishing an **infrastructure of democratic practices and structures** that involve school community members in broad-based, skillful participation in the work of district leadership
- 6) **Cocreating** accountability systems based on inquiry at all levels
- 7) Ensuring **collaboration** among multiple partners
- 8) Developing **transparent, multilayered** communications systems
- 9) Appraising community members of **whom to talk with** and how to get actions imitated
- 10) Modeling actions that **build system and individual leadership capacity**

(p. 85-87; boldface was added by the researcher for emphasis)

These acts coalesce around the themes of cultivating and sustaining vision, collaboration, and transparency—the same themes that emerged from the data of this study. What the SNA results revealed were that the leadership team was fragmented, with each sub-group relying heavily on each other (necessary in some instances but counterproductive to broad-based participation), making shared vision and collaboration across sub-group lines difficult. In turn, this insularity tended to foster a sense of non-transparency and dependency. If members of the administrative team felt that specific information was only available within another sub-group, they had to depend on that sub-group to obtain it. This was particularly evident when it came to vision. Almost everyone turned to the COA sub-group because it was seen by others and itself as the keeper of the vision; yet its members were themselves uncertain of this vision.

*Q2: How does leadership capacity—as measured by Lambert’s Leadership Capacity School Survey—inform the outcomes of the SNA and vice versa?*

Two points of data emerged from analyzing the SNA outcomes and the LCSS results in tandem. The first was that there was a wide range of results on the LCSS, as reflected in Table 4 below. When overlaid onto the combined Vision-Collaboration-Innovation network (Figure 17), certain key nodes—those to whom others consistently turn—have only moderate LCSS scores. One of the leadership acts Lambert (2003) cited as necessary to expand capacity is “modeling actions that build system and individual leadership capacity” (p. 87). If central nodes or leaders lack belief in the efficacy of capacity, then the SNA suggested that such capacity was unlikely to flourish.

The second point is reflected in the LCSS average per sub-group, also depicted in Table 4, which reinforces the degree to which capacity might be more superficial than real. The fact that the COA sub-group had a high opinion of capacity within the district was contradicted by the most disenfranchised sub-group, whose average score was half that of their bosses. Not only did members of the COSS feel left out but some within the COA sub-group felt they should be, not only because they were deemed dysfunctional but because they were not deemed co-equal, as evidenced by this statement from COA1: “You can’t create capacity unless it’s there to create. You come to the table with a certain amount of innate capacity to lead....but if that capacity isn’t there...I don’t think everybody has it. If it’s not there, you can’t build it. I don’t think everyone can lead.”

Table 4

*Leadership Capacity School Survey (LCSS) results by sub-group*

AGENT	LCSS SCORE
COA1	2.47
COA2	2.80
COA3	4.00
COA4	3.67
COA Average	3.24
BA1	3.27
BA2	2.60
BA3	1.20
BA4	4.53
BA5	1.93
BA Average	2.29
COSS1	2.20
COSS2	1.60
COSS3	1.13
COSS4	not completed
COSS5	1.53
COSS6	1.53
COSS Average	1.63

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Note: COA are Central Office Administrators. BA are Building Administrators. COSS are Central Office Supporting Staff. Scores are based on a scale of 1 to 5, with 1 representing the absence of that measure of leadership capacity and 5 representing abundance of that measure (see Appendix G).

*Q3: How do the SNA results affect attitudes of the district’s senior leadership concerning ways of working, organizing, interacting, and enhancing leadership capacity within the district?*

On the one hand, the SNA reinforced or validated current ways of working, interacting, and leading, which some saw in positive terms, while others saw it negatively or neutrally. On the other hand, the SNA opened up new possibilities for working and leading.

There was clear recognition that sub-groups tended to relate mostly among themselves. At the outset of the senior leader interview, COA1 made the following initial observation about the SNA results:

I think you see the central office administrators tend to interact with each other more. You see the building level group tends to interact with each other more, so there's some isolation. There's not always a flow back and forth between central office and building level, but I would expect that.

The expectation that some level of fragmentation or working within silos was normal and even positive was reinforced often throughout the senior leaders' interview, although there was no consensus on the matter. For example, while there was clear recognition that the COSS sub-group was not as involved as it should be, there was also admission that actively fostering this involvement would not be especially productive.

When exploring the Friends network (Figure 13), there was discussion about whether members of one group would or should socialize with someone outside their level. The SNA suggested that conformance to levels of status and job function permeated most interactions. In fact, COA4 often commented that it was hard to make conclusions about some of the network diagrams because they did not tell the full story behind the interactions. Factors such as longevity, access to knowledge or resources, and proximity may all drive how interactions played out (a limitation to be discussed in Chapter Five).

When examining the Interactions network, (Figure 16), COA1 asked, "Is interaction required to build capacity?" BA5 replied, "I think it promotes capacity. As we

get to know each other better, I think we're more willing to ask others to step out of the box." COA4 concluded the discussion stating:

If everybody marked the highest interactions [which was 6 = several times a day], we'd be meeting all the time and never get our jobs done. And that doesn't mean it's a good thing; it's a bad thing. But if the culture is that we can do what we need to do to get the job done, and every now and then we check in, I think that's a better thing.

As BA5 suggested, new possibilities for working and leading together were recognized, most especially among the younger and newer members of the group. BA3 spoke about including everyone in a process review in his school. Some of those he invited asked, "Do you mean me?" to which he replied, "Yes, I mean to include you." BA5 stated that support staff (minus janitors and secretaries) at his school participated in all professional learning community sessions. "We've worked their schedules so that they're at all our meetings. When the trainer came out and did training for us, they all had input; they're all in communities."

BA4 saw SNA as a way to initiate meaningful dialog. "A lot of it is about the conversations we have, that [SNA] sparks conversation and conversation always sparks improvement among us." COA3 added that an important way to expand leadership capacity within the district was to "have discussions so that people understand leadership capacity, then have discussions about what we can do as a group to expand leadership capacity. It makes new teachers feel like they can contribute and not let the same voices dominate the discussion." COA3 went on to say:

Capacity doesn't develop on its own. You can't have 40 teachers, 40 anybody, together without having someone to develop that capacity. That's why our jobs as leaders changed from the days when we told everyone what to do. We still need to do that at times, but it's developing that capacity...we can't do it by ourselves. If we don't develop that capacity, then we won't get maximum benefit from our staff.

*Q4: How do the SNA results affect attitudes of the district's senior leadership with regard to solving its most intractable problems?*

Social Network Analysis is nascent within the educational domain. Its newness and unique manner of data presentation made going beyond the conclusions of the last question all the way to solving intractable problems difficult, at least explicitly. At times, participants were more interested in trying to figure out who might be represented by a given node than anything else. Too, this study only scratched the surface of the capabilities inherent in a tool like ORA. In short, the analytical detail of this study was limited and basic (although a necessary place to start). This question demanded a more advanced employment of the SNA tool (which will be discussed under Implications for Future Research in Chapter Five).

Copies of the SNA data were sent to all senior leaders following their group interview, allowing for further reflection and the potential to link the SNA results to problems they had previously identified in the interview instrument given them during the first phase of the study. Among these problems were trust issues, building and sustaining momentum for professional learning communities, getting teachers to accept ownership for developing a collaborative culture and for student learning, and pushing

down programs from the central office without the requisite support and professional development. Such reflection might lead to the realization that these challenges could all be aided through a more explicit understanding of the organization's ongoing social interactions and what they reveal about the way an organization works, interacts, and learns. Such promise was voiced by COA1, who stated, "[SNA] is a good visualization of the patterns of interactions between groups regarding different areas....It's a good tool to reflect upon." At the very least, according to BA4, it is a conversation starter and, in his opinion, "conversation always sparks improvement among us."

### *Conclusion*

This chapter presented and analyzed the data arising from a case study of the Rivertide School District, and the ways in which leadership capacity might be informed through the employment of social network analysis. Two themes emerged from the ORA network visualizations: *isolation* and *cliquishness* (birds of a feather). Four integrating themes emerged from the combination of the ORA results, survey results, and interview results. These themes were *vision*, *collaboration*, *trust*, and *transparency*. In Chapter Five, the study's findings and conclusions will be drawn based on this data analysis. Also presented in Chapter Five will be a review of the limitations, as well as implications for practice and future study.

CHAPTER FIVE  
FINDINGS, RECOMMENDATIONS, AND CONCLUSIONS

*Introduction*

In order to study the ways in which social network analysis (SNA) might inform and serve to expand leadership capacity within a school district administrative team and beyond, a case study was undertaken and data triangulated from a series of face-to-face and electronic interviews, two surveys, and field observations. From this data emerged a number of inter-related patterns and themes, discussed in Chapter Four.

The first set of themes arose from the Organizational Risk Analyzer (ORA) network visualizations. They included a consistent, yet seemingly contradictory, pattern of *fragmentation* and *isolation* while simultaneously exhibiting a pattern of *flocking* or *cliquishness* among sub-groups. These two themes complemented four integrating themes that arose from all data sets.

These four themes were framed in oppositional terms because they emerged as much through their negative manifestation as their positive, much like an x-ray can be revealing, if not more so, than the object it captures. These themes included *vision* as opposed to managed programs; *collaboration* rather than isolation and fragmentation; *trust* instead of suspicion and avoidance; and *transparency* versus opaqueness and guardedness.

This chapter reviews these themes and other data arising from the SNA to derive findings based on the theoretical underpinnings of the study. These underpinnings include complexity theory, network theory, and constructivist leadership theory and its subset of leadership capacity.

## *Case Study Overview*

### *Purpose of the Study*

Organizations operate on multiple levels of human interaction, both formal and informal. Many of the formal networks are taken for granted and many of the informal networks are both subterranean and little understood. As a result, capacity within organizations may not be harnessed as effectively as it could be, depriving these organizations of the ability to deal effectively with the complex problems confronting them. Lambert's (2003) call for "skillful participation" through structured interactions requires greater transparency and mindfulness of the interactions occurring on a daily basis.

Lambert (1998, 2003) defined leadership as "reciprocal, purposeful learning in a community" (2003, p. 2), while capacity is defined as broad-based and skillful participation in that reciprocal learning.

Reciprocity helps to build relationships of mutual regard, thereby enabling us to become colearners. And as colearners we are also coteachers, engaging each other through our teaching and learning approaches. Adults as well as children learn through a process of inquiry, participation, meaning and knowledge construction, and reflection. (2003, p. 2)

Because SNA is relatively new, the ways in which it can inform leadership capacity have received little attention. This study sought to examine capacity more descriptively and holistically as an organic dimension of school communities, with particular focus on the district administrative team, which plays a crucial role in leading the improvement of school and student performance.

### *Research questions and data analysis*

Social Network Analysis holds such exploratory promises and served as a catalyst for the following research questions:

1. What does social network analysis (SNA)—to be referred to as measures of connectedness—reveal about the nature of leadership capacity within the administrative team of a district central office?
2. How does leadership capacity—as measured by Lambert’s Leadership Capacity School Survey—inform the outcomes of the SNA and vice versa?
3. How do the SNA results affect attitudes of the district’s senior leadership concerning ways of working, organizing, interacting, and enhancing leadership capacity within the district?
4. How do the SNA results affect attitudes of the district’s senior leadership with regard to solving its most intractable problems?

The SNA data revealed that within the Rivertide School District, leadership capacity was inhibited. Issues of trust, willingness to collaborate, lack of reciprocity, and isolation of both individuals and sub-groups resulted in a strong tendency among sub-groups to operate within their own circles.

With regard to the relation between SNA and LCSS, the data revealed that individuals to whom others turned on issues related to vision, collaboration, and innovation often lacked confidence in the district’s capacity for broad-based and skillful leadership. The data also revealed that such confidence was greatest among the senior-most sub-group, who from atop the organization assessed the current state of capacity

more optimistically than did the other sub-groups. The support staff was half as confident as its bosses in the degree of capacity that existed within the administrative team.

In terms of the way that the SNA affected attitudes of the district's senior leadership concerning ways of working, organizing, interacting, and leading, the data revealed a prevailing sentiment that current ways of doing business were not all that ineffective and, in some cases, were favored. To a limited extent, efforts were being undertaken to enhance capacity within the organization, and there was broad recognition that more needed to be done to involve the COSS sub-group.

Insufficient data were obtained to answer the final question with sufficiency and confidence. While it was recognized that SNA offered a unique tool for organizational analysis and discovery, there was no explicit connection made between the SNA results and the ways these results could be leveraged to solve the problems surfaced by the district's leadership as inordinately challenging.

#### *Discussion of Findings*

Employing the data just summarized, the researcher returned to the inter-related theoretical underpinnings of the study, which included organizational and leadership theories and their evolution, constructivist leadership and its sub-set of leadership capacity, complexity theory, and network theory, and drew out the findings that follow.

##### *Finding 1: Hierarchical or formal structures continue to hold sway*

Breaking free of old habits is difficult. The data revealed that while efforts such as Professional Learning Communities were being undertaken to yield the benefits of collaboration and shared leadership, nonetheless the default response to most situations was to rely on existing structures and ways of working. Yukl (2006) concluded that there

are a number of reasons organizations continue to privilege hierarchical structures and heroic leadership.

The first reason organizations cling to hierarchical structures and heroic notions of leadership is that they conform to the prevailing and unchallenged worldview that leadership equals leader, a form of circular logic from which it is difficult to break free. Yukl (2006) argued that theories and conceptions of leadership are laden with biases. These theories “include the often implicit assumption that leadership is primarily about heroic individuals who possess essential traits and skills and use appropriate behaviors to motivate and develop effective dyadic relationships with subordinates” (p. 448).

Heroic conceptions of leadership further reinforce historical power structures. A structural (Newtonian) worldview was, and remains, a means to justify the patriarchy and the patriarch. As a consequence, theories of leadership tend to focus exclusively on the individual or individuals at the top of the pecking order, still predominately men (Yukl, 2006).

A less polemical reason for viewing leadership heroically is the need for simplicity. The human tendency is to systematize the complex world. Without question, organizations and leadership *are* complex in their nature. In attempts to come to grips with them, humans tend to “exaggerate the importance of leaders in order to explain events in a way that fits [their] assumptions and implicit theories” (Yukl, 2006, p. 449). As Yukl described, there remains the compulsion to see and explain the world in rational terms when, in fact, it is ambiguous, messy and often incomprehensible.

The need for simplicity and rationality leads inexorably to the last and most compelling reason organizations cling to outmoded visions of leadership: the demand for

accountability. Formal leaders take to heart the dictum that they are responsible for everything their organization does or fails to do. This demand for responsibility and accountability often has legal and funding implications, but it arises from the same implicit biases and assumptions that undergird the long-held belief that leadership is, at its core, about the qualities and behaviors of the person at the top of the organization. The need for accountability carries with it the onerous implication that the formal leader can touch everything and shape all outcomes, which are tenuous and even dangerous assumptions to make.

Based on the data derived from this study, Rivertide School District, implicitly defaulted to its formal structure in which there were clear lines of demarcation between the central office, the schools, and the supporting staff. It did so despite explicit efforts, such as adoption of PLCs, designed to break down silos or barriers between and among key sub-groups.

*Finding 2: “Birds of a feather” do flock together*

Repeatedly in the ORA network visualizations, there was a clear pattern of individuals in similar roles, at similar levels within the organization, favoring each other in their interactions. This sub-group cliquishness supported what Krebs and Holley (2006) characterized as “two simple, yet powerful driving forces [within networks]: (a) Birds of a feather flock together; and (b) those close by, form a tie” (p. 4).

In the extreme, according to Krebs and Holley (2006) such clustering is both bad and good. On the negative side, there is little or no diversity within each cluster.

“Everyone in the cluster knows what everyone else knows and no one knows that is going on in other clusters. The lack of outside information, and dense cohesion within the

network, removes all possibility for new ideas and innovation” (p.4). On the up side, “the dense connections, and high degree of commonality forms good work groups—clusters of people who can work together smoothly” (p. 5).

Rivertide School District capitalized on the benefits associated with formal teaming by actively cultivating communities of practice and learning. At the same time, it recognized that further work needed to be done to overcome fragmentation, isolation, and cliquishness that were made more explicit through SNA.

*Finding 3: Transparency, trust and collaboration are deeply inter-dependent and underpin capacity*

One study participant noted that in the physical world capacity is a measure of volume. If the ability to achieve greater volume is impaired, then so too is capacity. Transparency, trust, and collaboration all contribute to capacity and were, to some degree, impaired within the Rivertide School District.

Lencioni (2002) cited lack of trust or an unwillingness to be vulnerable to others as one of five dysfunctions of a team that can debilitate its ability to achieve optimal performance. Seen another way, dysfunction, especially dysfunction that can be remedied, shows a lack of skill, and skillfulness is essential to leadership capacity-building (Lambert, 2003).

In order to enhance skillfulness, transparency is necessary; otherwise, organizations run the risk that their collaborative efforts will seem superficial, as was the perception within Rivertide School District. The potential value of a tool like SNA is its ability to make the inner workings of an organization more transparent and, as a result, guide and shape those inner workings with greater precision (Cross & Parker, 2004;

Krebs & Holley, 2006). Still, even as SNA can create greater transparency, it also depends on transparency. In this study, the names were anonymized to protect the identities of those participating. In so doing, the full power of the application was diminished. A lack of comfort being vulnerable with each other meant that full transparency was not achieved. This condition, in turn, meant that collaborations (connections) could not be assessed fully for their strengths and weaknesses. Weak connections could not be strengthened; bad connections could not be fixed; new and necessary connections could not be created, etc.

It was noted earlier that capacity is complexity and vice versa. A fully-networked organization is more complex than a hierarchical one (Bar-Yam, 2004; Kelly, 2003); therefore it follows that deliberative efforts, informed by SNA, to flatten the organization and expand, energize, and shape network ties will result in expanded capacity. This ongoing process starts with trust—the willingness to be vulnerable to others (Lencioni, 2002), which is a form of transparency—that in turn leads to greater transparency, smarter, more informed decisions, and enriched interactions and strengthened collaboration.

*Finding 4: Social networks **are** the organization, making SNA an essential diagnostic and decision-making tool*

The data gathered during this study, especially through interview responses and direct observation, made clear that the district's leadership team left many potentially powerful social interactions to chance. It did so because such interactions were largely invisible to them.

According to Bar-Yam (2004), complex entities are characterized by emergence, “the relationship between the details of a system and the larger view” (p. 27) and interdependence, the notion that every part of a system is integrally connected to another. The tendency is to see organizations by their complete outward manifestation, often captured by their formal organization chart. Yet solving organizational problems typically requires seeing them in terms of the complex interactions of their discrete parts. Both views are necessary but it is the second one that is often overlooked, a fact reinforced by Cross and Parker (2004):

As a result of delayering, globalization, and the rise of knowledge intensive work, social networks...have become a pervasive feature of organizations. These seemingly invisible webs have also become central to performance and execution of strategy. Research shows that appropriate connectivity in well-managed networks within organizations can have a substantial impact on performance, learning, and innovation. (p.vii)

Another way of explaining emergence is “where local interactions lead to global patterns” (Krebs & Holley, 2006, p. 3-4). In other words, by understanding discrete connections, and energizing them in intentional ways, leaders can guide the patterns that emerge at the organizational or global level. “Instead of allowing networks to evolve without direction, successful individuals, groups and organizations have found that it pays to actively manage [their] network” (p. 5).

Social Network Analysis (SNA), therefore, becomes an absolutely essential tool for organizational health and performance, just as an x-ray is indispensable in ensuring human health. SNA provides a diagnostic tool that allows leaders and organizations to

peer beyond the surface of their organization and make decisions designed to make it healthier and smarter.

### *Integrating Heuristic*

In light of the data analysis and findings, Figure 27, introduced in the previous chapter, was modified to create an integrating heuristic, presented in Figure 28.

Collaboration, trust, and transparency create the environment in which candid conversations and meaningful connections can occur. These conversations and connections begin in the core of the network and expand outward to the periphery. They are ongoing and smartly managed by all, but especially by the formal leaders of the organization. Shared vision backgrounds everything and serves to bind, coalesce, and focus these conversations and connections across all levels, teams, sub-groups, and stakeholders. Capacity expands as a result of deliberate, ongoing, focused conversations and connections, within an open and encouraging environment, and shaped by vision.

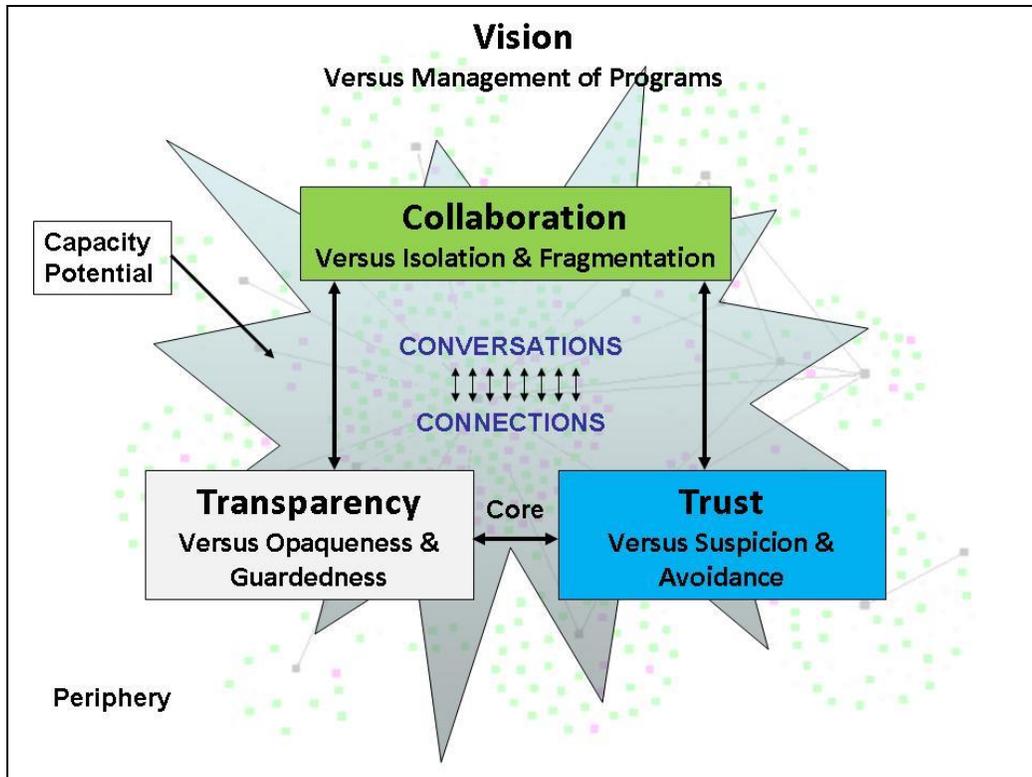


Figure 28: Leadership capacity integrating heuristic

### *Limitations*

Cross and Parker's (2004) list of potential limitations to SNA was a helpful lens through which to examine the study's limitations. This section re-examines these limitations from the back end of the process, with the benefit of 20-20 hindsight. Cross and Parker's list of limitations (also discussed in Chapter One) has been amended and updated based on lessons learned from the conduct of the study.

1. Surveys only capture so much information about the network. Respondents may forget or misreport interactions, either consciously or unconsciously. This study examined 12 fundamental network views but an infinite number exist. It also studied only one dimension of the participants: the role or function they filled (central office administrator, building administrator, or

central office support staff). One participant complained that other factors, such as gender, tenure, subject-matter expertise, to name a few, could have influenced how each person answered the survey. A new person, for example, may have indicated higher interactions with the support staff than a person with considerable longevity in the district. Also, each network was depicted in pictorial form as part of a PowerPoint presentation. The ORA software allows for a much more dynamic depiction of networks. Ideally, given time and capability, the study would have benefited from each participant in the group interview sitting behind a computer screen in which the researcher could have presented the network visualizations employing the ORA software in real time. This would have allowed such possibilities of highlighting nodes and links for relevant data, removing nodes or links to assess the impact, and seeing each network from multiple angles.

2. Surveys are only as good as the researcher who develops them and should be developed in close coordination with knowledgeable network members. One reason for the initial face-to-face interview with the superintendent was to secure his input into the refinement of the SNA survey. However, there were questions on the survey that were interpreted widely. The most glaring example were those questions that incorporated a qualifying word like “most,” as in “Please indicate who contributes most to your professional growth and development.” Some interpreted this to mean only one person. Others interpreted it to mean more than one. Also, Question 11 on the survey was problematic because it asked, “Who inspires you with his or her courage to

speak up when it most matters?” The researcher’s aim was to create a Courage network, yet some focused on the word “inspires” while others on “when it most matters.” While any question will never be free from interpretation, greater care in the framing of SNA questions is essential to obtaining consistent responses.

3. Social network analysis is constrained by the expertise of the analyst or researcher. This study was undertaken by a researcher with no previous background in SNA who taught himself the mechanics and processes. The researcher did turn to the developers of the ORA software for assistance, which mitigated improper use of the application. However, his novice status kept him from fully leveraging ORA’s robust capabilities, such as the ability to examine networks over time, which would have enriched his findings. As previously stated, this study was basic and only employed a limited set of SNA’s capabilities.
4. Network diagrams are prone to misinterpretation: “diagrams can appear complex to someone looking at them for the first time, and occasionally managers will read into them what they want to see and overlook what the information is actually suggesting” (p. 140). The researcher would take exception with Cross and Parker’s(2004) use of the term “misinterpretation” because it implies that the researcher/analyst has the right interpretation and managers do not. Rather, the researcher only has a more informed interpretation, but there is no right or wrong answers. The value of SNA is the qualitative self-analysis undertaken by the organization. Rather than

misinterpretation, the chief limitation faced by organizational members unfamiliar with SNA is the ability to glean the fullest and most informed interpretation possible.

5. Network diagrams and data can lead to defensiveness and require a focus on the system and not on individuals. This limitation is less one of the study than one of the organization. In other words, organizations must be made aware that if defensiveness, lack of transparency, and lack of trust are operative, then the potential value of a tool like ORA is diminished.
6. Taken to an extreme, network diagrams can be used indiscriminately to take unwarranted personnel actions. The analyst must continually explain these limitations and contextualize the information to avoid such potential outcomes. Because the names of the participants were anonymized, this limitation was avoided. However, fears like this are what caused the superintendent to request a more guarded approach to the study, which limited the insights that could have been drawn.

#### *Implications for Practice*

Complex challenges confront educational leaders in the Information Age, leading to the question: “If the current global environment is indeed chaotic and uncertain, if complexity underpins every system and process and if determinism is no longer consistently operative, what are educational leaders to do?” In reply, five strategies, derived from the literature, addressed the need to rethink the ways in which leadership is enacted. These five strategies offer a worthwhile platform for redefining practice in the 21<sup>st</sup> Century.

*Think more complexly.* This study revealed that organizations tend to default to the status quo when it comes to structures and leadership. Despite efforts to enact more democratic, diffused, or decentralized leadership, such as Professional Learning Communities, organizations still find it difficult to break free of the hierarchical structures that formally define them and discover that sweet spot on the continuum between rigid hierarchies and leaderless networks (Brafman & Beckstrom, 2006). Breaking free and finding this “sweet spot” are essential in an age that is increasingly inter-connected and flat.

Drath (2003) stated that the first step to dealing with complex problems may, at first, seem counterintuitive: to create even more complex capacity. “A complex capacity to respond means something different from just a more complicated process. It means a more varied, less predictable, more layered process capable of greater subtlety” (p. 6). How might educational leaders create this complex capacity?

First, they need to recognize that their organizations are more than their formal structures and processes. Rather than work so hard to constrain people and procedures into rigid roles and rules, leaders should instead focus on cultivating and channeling energy along acceptable paths. Kurtz and Snowden (2003) offered a powerful example. A group of West Point cadets were given an assignment to manage the playtime of a kindergarten class. They planned in great detail, establishing objectives, creating a timetable, assigning roles, and anticipating how they would respond if the children acted a certain way. It was a rational plan, and the cadets sought to execute it in like manner. The result was chaos. In short, they over-controlled the situation. They then observed how experienced teachers “managed” playtime. At the outset, these experienced teachers

allowed for a greater degree of freedom, intervening only to strengthen desirable patterns and weaken undesirable ones. The most experienced among them channeled or nudged behavior in such a way that only acceptable patterns emerged.

Cultivating acceptable patterns will invariably lead to a more networked organizational structure, and leaders must be quick to embrace the network structure and its benefits, even as they work to minimize its shortcomings, such as dealing with accountability. What leaders today can ill afford is to revert back to default structures that prevent transparency, mitigate trust, and diminish collaboration. In essence, the metaphor for work and classroom learning is playtime, which, echoing Drath (2003) is inherently more varied, less predictable, and more layered. But, as a result, it is more flexible, dynamic, fault tolerant, and nimble, making play a more appropriate way to facilitate learning in a complex environment.

Implied in the Kurtz and Snowden's (2003) West Point example is that even as teachers allowed for greater autonomy, they nonetheless were fully present. Networks, to be fully effective, cannot be left to chance (Krebs & Holley, 2006). They must be cultivated and pruned continually. Social Network Analysis tools, like ORA, provide a means to grow and shape networks smartly, and educational leaders should be exploring and leveraging their benefits. ORA is free to download and training is provided every summer on the Carnegie Mellon campus for a nominal fee.

Presence does not necessarily mean physical presence, although physical presence is immensely powerful. Presence can also be effected through phone calls, text messages, blogs, and other electronic media. Information Age leadership makes being comfortable with and employing these new media tools imperative. At the very least, every district

needs a robust, compelling website and every superintendent needs to create, maintain, and sustain a blog that serves as his or her bully pulpit from which to reiterate, clarify, and reinforce the district's vision. Even as there are physical communities of learning and practice, there should be virtual ones, too. Such communities invite wider participation and help to expand capacity.

*Let go.* Counter-intuitively, letting go is not about less work but more. It is not about simply formulating programs and then decentralizing their implementation. Nor is it a laissez-faire approach to leadership. It is about letting go of ego and power trips, shedding inhibitions, and inviting broader participation in problem solving and sensemaking.

In terms of practice, letting go starts with a compelling vision—a narrative that unifies every action and activity and enables this sensemaking. It becomes the lens through which meaning arises in acceptable forms. Creating such a vision is a difficult task but must be given the time and resources needed to make it happen. The district in this study had a district vision and a vision for every school. The district's vision was new, but copies of the old one still hung on the walls. Not everyone knew the district's new vision by heart, even though its core was a single, simple sentence: *Working together to help all children learn.*

There is power in a simply worded vision (Heath & Heath, 2007). Yet, the vision must make clear the ultimate outcome of all efforts. In the statement *Working together to help all children learn*, one might ask if the desired outcome is working together, helping, or all children learning.

Lessons learned by the United States Army can be instructive when creating a vision that enables leaders to let go with confidence and know the mission will be accomplished. Figure 28 provides an excerpt from Army Field Manual 3-0 (Feb 2008) that defines the type of leadership essential for success in today's complex operations:

3-29. The Army's preferred method of exercising command and control is mission command. **Mission command is the conduct of military operations through decentralized execution based on mission orders. Successful mission command demands that subordinate leaders at all echelons exercise disciplined initiative, acting aggressively and independently to accomplish the mission within the commander's intent.** Mission command gives subordinates the greatest possible freedom of action. Commanders focus their orders on the purpose of the operation rather than on the details of how to perform assigned tasks. They delegate most decisions to subordinates. This minimizes detailed control and empowers subordinates' initiative. Mission command emphasizes timely decisionmaking, understanding the higher commander's intent, and clearly identifying the subordinates' tasks necessary to achieve the desired end state. It improves subordinates' ability to act effectively in fluid, chaotic situations.

3-30. Mission command requires an environment of trust and mutual understanding. Respect and full familiarity with the commander's intent and concept of operations are also essential. Mission command applies to all operations across the spectrum of conflict. The elements of mission command are—

- Commander's intent.
- Subordinates' initiative.
- Mission orders, which include—
  - A brief concept of operations.
  - Minimum necessary control measures.
- Resource allocation.

3-31. Chaos and uncertainty dominate land conflict. Predictability is rare, making centralized decisionmaking and orderly processes ineffective. In addition, commanders must contend with a thinking, adaptive enemy. Under such conditions, leaders of forces in contact can often see and act on immediate opportunities and threats better than their superiors can. Delegating the greatest possible authority to subordinates helps the force adapt the operation to the situation quickly and retain the initiative.

3-32. While mission command restrains higher level commanders from micromanaging subordinates, it does not remove them from the fight. Rather, mission command frees these commanders to focus on accomplishing their higher commander's intent and on critical decisions only they can make. Higher commanders anticipate developments, allocate resources to exploit successes, and intervene to shape the operation as necessary. Mission command is ideally suited to an environment of complexity and uncertainty.

Figure 29: Army definition of mission command

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Note: From Field Manual (FM) 3-0, Feb 2008, p. 3-6.

Essential to the establishment of mission command is the Commander's Intent or vision statement. According to Heath and Heath (2007), a Commander's Intent statement is a "crisp, plain-talk statement that appears at the top of every order;" it is meant "to align the behavior of soldiers at all levels without requiring play-by-play instructions

from their leaders;” and it answers the question, “the single, most important thing that we must do tomorrow is...” (p. 26-27). In light of this construct, Rivertide School District could undertake a meaningful re-evaluation of its vision statement so as to foster a letting go that empowers subordinates without making them feel isolated or under-guided.

*Expand capacity at all levels.* Letting go cannot happen without the complementary action of expanding capacity. One must let go in order to create the conditions by which capacity can expand and by expanding capacity, one is able to let go more readily.

One Central Office Administrator in this study stated that if interactions were at their highest level, no work would get done because people would be constantly interacting and talking. Yet according to constructivist leadership, interactions and conversations enable the construction of meaning and learning, whether among students or among adults (Lambert, 2002). As was noted in the Findings, interactions and conversations are the organization; they are its essential work and business. The key to expanding capacity is to manage and focus the conversations and shape the connections in deliberate and disciplined ways. Social Network Analysis becomes a powerful and essential tool for managing capacity-building activities.

*Move toward profound simplicity.* Profound simplicity is what the West Point cadets discovered in the seasoned teachers’ approach to children’s playtime. Weick (2008) would suggest that the way these teachers became seasoned was through persistent trial and error. Lambert (2002) would add that they engaged in continual reflective conversations, both with themselves and with each other, in which they noted

patterns over time that enabled them to guide behavior without resorting to over-controlling it.

Weick (2008) argued that dealing with complexity requires persistent sense-making: “sensemaking is dynamic and requires continuous updating and reaccomplishment. As a leader, don’t let people languish in the feeling, ‘Now we have it figured out.’ They don’t have it figured out” (*Leadership when, ¶ 6, bullet 6*). Dealing with the inexplicable is about talking as you go, in the form of stories that describe what is being faced and how to deal with it. Profound simplicity means allowing these stories to unfold.

Here again, SNA provides a tool to start meaningful and informed conversations about how members of an organization habitually interact. Sensemaking and discovery are both affected by who is contributing to the conversation. The more perspectives that are included in the discovery process, the more transparent and fully-faceted the arrived-at solutions will be.

Seen another way, SNA can be viewed as a profoundly simple way to view organizations. Through the examination of simple nodes and lines (edges), organizations begin to tap into and make sense of profoundly complex human dynamics.

*Start small.* Social network analysis offers a first step towards understanding and harnessing invisible energy within an organization, energy that comes about as a result of social interactions, large and small. By employing a tool like ORA, educational leaders can begin to make these invisible force fields more explicit and align them with the vision of the organization. In so doing, the skill with which the work of leadership is accomplished is sharpened and broadened, expanding capacity to such a degree that the

complex challenges confronting educational institutions can be met head on with greater hope of mastering them.

### *Implications for Future Research*

Given how nascent Social Network Analysis is within the educational domain, the opportunities for future research are immense. Students with backgrounds in social sciences or computer sciences may find a particular affinity with the employment of SNA to examine a host of issues surrounding educational institutions. This researcher became fascinated with SNA by accident, stumbling into it after reading two books on network theory, which were offhandedly recommended by a colleague. Future studies that employ SNA would benefit, at the very least, from a greater familiarity with the software application chosen. As mentioned previously, the ORA application is free and a week-long summer institute is hosted by Carnegie Mellon for around \$650 for graduate students. Factoring in this time and money into the research cycle is critical for researchers interested in expanding this knowledge area.

Greater familiarity with the software alone will provide ample research opportunities. For example, the ORA application allows for more than merely an examination of agent-to-agent interactions, as was studied here. Its “metanetwork” configuration allows researchers to create networks that include agents, tasks, knowledge sets, locations, and events, or any combination of these. For example, a study could be undertaken that seeks to examine how teachers with particular knowledge interact with other teachers. Are these subject-matter experts or teacher-leaders connecting effectively with those who might need their expertise?

As its name implies, ORA allows researchers to analyze risk, and to assess how a change to or in the network would affect the total organization. Research could be undertaken to analyze, for example, how the introduction of a new node, say a parent advocate, would affect outreach into the community. Links could also be analyzed in order to see which linkages are most critical. How would adding a link between two sub-groups affect information flow? And, how would the removal of a link or node impact the network? It is not that SNA necessarily forms the totality of the research undertaken but supplements it. A study on the role of parent advocates, for example, would include data from interviews, focus groups, surveys, etc. The SNA data would serve to triangulate these other sources of data.

ORA also allows for analysis over time and other simulations. A researcher seeking to understand how a new policy propagates through an organization and affects alliances could employ ORA to assess network links before, during, and after policy implementation.

Another line of inquiry would seek to examine what happens after an SNA has been undertaken. In what ways can and does SNA inform changes within a school district such as Rivertide? What insights did SNA offer leaders that enabled them to implement meaningful changes? The challenge here, as with any over-time study, is the impact on both the subject of the inquiry and the researcher.

Discovery begets discovery. Each new effort employing SNA will simultaneously build upon existing knowledge and open new opportunities for discovery. Like Moses, this researcher got to the edge of the Promised Land but did not enter into it fully. That opportunity remains for those excited by the prospects and promises of SNA to unlock

both hidden networks and potential within our educational institutions that will empower them to succeed in ways not now possible.

### *Concluding Overview*

The challenges confronting humans today in all fields of endeavor are complex in their nature. Educational institutions are faced with demands for improved student achievement against a backdrop of reduced revenue streams, increased diversity, mounting social challenges, changing demographics, and rising teacher attrition. Faced with these challenges, along with the impact of advancing technology and social media, new forms of leadership are becoming imperative. Bar-Yam (2004) and Drath (2004) both noted that in order to survive within complex environments, organisms must themselves become complex. Kelly (2003) posited that the pure network was the most complex social configuration possible, while Brafman and Beckstrom (2006) recognized that fully-networked, leaderless organizations are more theoretical than practical. Instead, organizations fall along a continuum between pure hierarchies and pure networks. In the Information Age, organizations need to move along the continuum closer to the pure network and find their “sweet spot” there (Brafman & Beckstrom).

Becoming a more networked organization demands new forms of leadership. Bolman and Deal (2003) revealed that over time the ways in which organizations were understood have evolved from structural to symbolic, and the type of leadership needed for each has also evolved. Hierarchies and heroic leadership worked when organizations were viewed structurally. Now that organizations are viewed symbolically as hives or networks, heroic leadership can no longer work. Constructivist leadership and its subset

of leadership capacity were examined as offering the type of leadership needed for organizations that today operate amidst complexity.

This study sought to examine the ways in which an Information Age tool, Social Network Analysis, could be employed to expand leadership capacity and move an organization along the continuum towards being fully networked. What the study discovered is that inertia continued to keep the school district leadership team under study from breaking free of its formal structures, despite its best intentions to open up lines of communication. The results indicated that participants continued to align themselves with like others and in so doing created isolation and fragmentation. The study found that transparency, trust, and collaboration were all, to varying degrees impaired, and thus hampered the expansion of capacity necessary to become more networked. Finally, it found that human connections are the core of the organization and that many of these connections and interactions were left to chance because they were unknown. The power of SNA is the ability to uncover these interactions and manage them smartly.

Social Network Analysis has limitations, as does any analytical tool, but if conversations and connections are indeed the fuel that drives both organizational and leadership engines toward self-discovery, knowledge, and meaningful adaptation to their environment, then SNA becomes an indispensable tool for educational leaders to embrace. This study only scratched the surface of possible insights that can be derived from SNA. Hopefully it will spark interest that will lead to a network of insights from which meaningful and lasting solutions to the challenges confronting educational institutions can be derived.

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## Appendix A

### REQUEST TO CONDUCT STUDY

From: Hill, Robert CIV USA TRADOC  
Sent: Monday, February 02, 2009 3:23 PM  
To: Dan Reeves  
Subject: Dissertation Study Request (UNCLASSIFIED)

Classification: UNCLASSIFIED  
Caveats: NONE

Dan,

I am reaching out to see if you might be able to support the conduct of my dissertation study within your district, more specifically within the central office itself.

I am exploring the use of social network analysis (SNA) to inform and expand leadership capacity within a central office. My aim is to mitigate its impact on operations although it will require some time and resources.

The study has four phases. Here's what each one entails and its time/resource impact:

1. An interview with you of about 10 questions, which I envision taking 60 minutes. Subsequently, the same set of questions will be sent via email to the assistant superintendents and principals for completion via email.
2. The administration of two survey instruments: The Leadership Capacity School Survey (LCSS) and a Social Network Analysis survey (the data will be fed into an social network analytic tool). These would be taken by all members of the central office and take roughly 30 minutes.
- 3 A final interview with the senior leadership team (however you define it) for about 30-60 minutes.

I am presenting my dissertation proposal the middle of this month and hope to have a green light to conduct the study within a week afterwards. My desire would be do conduct Phases 1 and 2 by no later than early March, as it will take two weeks, at least, to feed the survey data into the SNA software and produce results to share at the focus group. Ideally, I'd like to have all phases complete by the end of March.

I deeply appreciate your consideration and, if favorably considered, look forward to our future interaction.

Rob

Robert Hill

Appendix B

**APPROVAL TO CONDUCT STUDY**

From: Dan Reeves  
Sent: Monday, March 09, 2009 1:18 PM  
To: Hill, Robert CIV USA TRADOC  
Subject: RE: Dissertation Study Request

I approve this study to be conducted in the Rivertide School District.

Dan Reeves, Superintendent  
Rivertide School District  
.

## Appendix C

### INFORMED CONSENT FORM

#### Dear Participant:

Thank you for considering participating in a research study titled *Leadership Capacity in a Complex Connected Age*. This study is part of my dissertation research for a doctoral degree in educational leadership and policy analysis from the University of Missouri-Columbia. The information gathered should be beneficial to K-12 leaders interested in expanding leadership capacity at all levels, using accessible Information Age tools. Your participation has been approved by your superintendent and the Director of Research and Assessment.

#### PURPOSE

The purpose of this research is to examine whether the employment of social network analytic tools can help inform and expand leadership capacity within a district central office. Leadership capacity is defined as a combination of *broad-based participation* in school governance, learning, and leading and the *skillfulness* of this participation. Social network analysis is a burgeoning field of research that explores human network structures that exist within organizations. The researcher will use a case study approach in which he examines the types and nature of social networks that exist within the *administrative team* of the district. For this study, administrative team will be defined as all members of the district's central office, along with the principals of the district's member schools. Surveys will seek to determine the sorts of social networks that exist within the organization and how these networks might contribute to increasing the degree of participation and skillfulness. For example, one such network will focus on innovation, another on governance, and another on visioning. Separately and collectively, these networks can reveal how information flows, work gets accomplished, and capacity grows.

#### PROCEDURES

For the specific purposes of this study, the researcher will undertake a three-phase collection strategy. Each phase was designed to collect data that will facilitate answering the questions under study.

*Phase One:* In this preliminary phase, the researcher will obtain permission from the School District to conduct the study. He will then schedule and conduct a preliminary interview with the superintendent to explain the aims of the study and the mechanics of conducting it so as to minimize impact to the functioning of the central office. This interview will also seek to obtain insights from the superintendent on his/her awareness of informal network structures that might exist among the administrative team of the district and the types of ties that the

superintendent believe are important to measure in order to gauge leadership capacity. Based on these responses, the researcher will finalize construction of the network analysis questionnaire to be administered to all member of the administrative team.

*Phase Two:* In this phase, the researcher will have all members of the administrative team complete Lambert's Leadership Capacity School Survey (LCSS), as well as an social network analysis (SNA) questionnaire. The researcher will score the LCSS and input the data from the SNA questionnaire into a software application, producing network maps and measures.

*Phase Three:* In this phase, the researcher will present the data for both the LCSS and the SNA to the senior leaders of the administrative team, consisting of the superintendent, assistant superintendents, and school principals, because this group of individuals can best leverage the results and emergent insights to expand leadership capacity within the total organization. This senior leaders group will self-assess the data and drew conclusions from them that can lead to more informed and proactive development of leadership capacity.

## **PARTICIPATION**

Participation in the study is completely voluntary. You may withdraw from participation at any time you wish without penalty, including in the middle of the interviews or after they have been completed. Your consent to participate or refusal to participate will not affect your employment in any way. You may also decline to answer any questions that you feel are too uncomfortable to answer. Please do not hesitate to contact me with any questions or concerns about your participation. You can call me at 205-495-8814. In addition, you are also welcome to contact the dissertation advisor for this research study, Dr. Barbara Martin, who can be reached at 660-543-8823. If you have a question about your rights as a research participant, you should contact your Compliance Office and/or the University of Missouri Institutional Review Board office at (573) 882-9585.

## **CONFIDENTIALITY AND DISCLOSURE**

Tapes and transcripts will remain confidential and separate from any identifying information. A pseudonym will be assigned to responses for use by the researcher. You will have the opportunity to verify the transcribed interview for accuracy of what was stated and what you intended. Edits, deletions, and clarifications will be made immediately to the transcript to comply with your right to voluntarily release data. Only the researcher and the dissertation supervisor will have access to identifiable data. Collected data will be kept locked and destroyed three years after the completion of this study.

Your identity and your district's identity will be confidential in the reporting of results. I will not list any names of participants or their corresponding positions or departments in my dissertation or any future publications of this study.

This research has been preauthorized by the Institutional Review Board of the University of Missouri-Columbia. If you have further questions regarding research participants' rights, please contact the University of Missouri-Columbia Campus Institutional Review Board at (573) 882-9585, or visit <http://www.research.missouri.edu/cirb/index.htm> or <http://ohrp.osophs.dhhs.gov/humansubjects/guidance/45cfr46.htm>.

### **INJURY OR ILLNESS**

The University of Missouri does not compensate human subjects if discomfort eventually results from the research. Nonetheless, the university holds medical, professional, and general liability insurance coverage, and provides its own medical attention and facilities if participants suffer as a direct result of negligence or fault from faculty or staff associated with the research. In such unlikely event, the Risk Management Officer should be contacted immediately at (573) 882-3735 to obtain a review of the matter and receive specific information. Related ethical guidelines about Protection of Human Subjects set forth in the Code of Federal Regulations "45 CFR 46" will be upheld. This statement is not to be construed as an admission of liability.

### **RISKS AND BENEFITS**

The risk of your participation is minimal. As stated above, the information gathered should be beneficial to K-12 leaders seeking ever new ways of building leadership capacity within their organizations so as to improve overall achievement.

### **COSTS TO STUDY PARTICIPANTS**

There will be no cost to participate in the study other than your time.

### **COMPENSATION**

There will be no compensation for participating in the study. If you choose to participate in this study, please complete the information below. The researcher will provide no compensation to the student participants. However, if you choose to offer extra credit to those students volunteering to participate, the researcher asks that you also offer extra credit to students unwilling to participate. The extra credit offered to these students should be of equal effort to the extra credit offered the student interview participants.

A copy of this letter and your written consent should be retained by you for future reference. Thank you for your time and consideration.

Sincerely,

Robert M. Hill  
Doctoral Candidate

**SIGNATURES**

A signed statement of informed consent is required of all participants in this project. Your signature indicates that you understand and voluntarily agree to the conditions of participation described above, and that you have received a copy of this Form.

I agree to take part in this study. I have had a chance to ask questions about being in this study and have those questions answered.

\_\_\_\_\_  
Printed Name of Participant

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

Appendix D

**Interview Protocol Form**

Date \_\_\_\_\_

Beginning Time \_\_\_\_\_ Ending Time \_\_\_\_\_

Participant \_\_\_\_\_

Location \_\_\_\_\_

Field Notes:

## Appendix E

### **Superintendent/Senior Leader Interview**

1. What are the toughest, most complex problems your district faces right now?
2. What makes these problems so tough and complex?
3. What kind of leadership do you feel is essential to dealing with these problems/challenges? Put another way, describe your vision of the kind of leadership that's needed today? What does it look like?
4. One emerging theory of organizations is that there exist, in addition to their formal structure (hierarchy), a lattice or web of informal networks. Does such an image resonate for you and your organization? How?
5. How do you react to the statement that leadership is a capacity of the entire organization, not just the formal leader?
6. How would you define leadership capacity? Describe the ways it is manifest in your organization.
7. Do you do anything deliberately to cultivate this capacity?
8. Assuming that informal structures or webs of interactions exist on a less visible level but could be made more explicit using an analytic tool, what would you hope such analysis might reveal about your organization?
9. Are there particular skills or knowledge sets that you believe need to be more evident in your organization? What are they and why are they important?
9. How might you use the results of the social network analysis to further build capacity within the central office?

Appendix F  
SNA Survey

<b>Name</b>												
<b>Years with the District</b>												
<p><b>Directions:</b> In the column matching the question number, place an <b>X</b> beside each name that you believe answers the question. There may be more than one <b>X</b> per column. For Q12, instead of an <b>X</b>, place the number that specifies the frequency of your interactions with the persons with whom you work routinely. If you never interact with someone, leave the box beside his or her name blank.</p>												
<p><b>Q1: To whom do you typically turn for help understanding and implementing the district’s vision and mission?</b></p> <p><b>Q2: With whom do you typically collaborate to align what the district does each day with this vision?</b></p> <p><b>Q3: To whom do you typically turn for fresh ideas and innovation?</b></p> <p><b>Q4: Who amongst the staff challenges you through dialog and questions to think hard about what you do each day?</b></p> <p><b>Q5: Who amongst the staff is the most entrepreneurial and willing to take on new challenges?</b></p> <p><b>Q6: Please indicate who contributes most to your professional growth and development.</b></p> <p><b>Q7: To whom do you typically turn when you hear something troubling about the way that the district operates?</b></p> <p><b>Q8: To whom do you turn if you want the “plain, unvarnished truth”?</b></p> <p><b>Q9: Who are your friends...those you are most likely to socialize with outside of work?</b></p> <p><b>Q10: Who gives you the most hope that the challenges the district faces can be solved?</b></p> <p><b>Q11: Who inspires you with his or her courage to speak up when it most matters?</b></p> <p><b>Q12: Who do you routinely interact in the conduct of your job and what is the frequency of the interaction?</b></p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: left;"> <p>1 – Once per month</p> <p>2 – Two to three times per month</p> <p>3 – Once per week</p> </div> <div style="text-align: left;"> <p>4 – Several times per week</p> <p>5 – Once per day</p> <p>6 – Several times per day</p> </div> </div>												
<b>Name</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Q6</b>	<b>Q7</b>	<b>Q8</b>	<b>Q9</b>	<b>Q10</b>	<b>Q11</b>	<b>Q12</b>
Name 1												
Name 2												
Name 3												
Name 4												
Carol Spencer												

Appendix G  
**Leadership Capacity School Survey**  
 Reduced Form (Pierce, 2007)

*This survey is designed to assess the leadership capacity of your central office. The items are clustered according to the characteristics of school organizations that exhibit high capacity.*

*Once each staff member has completed the survey, the results will be presented in a chart depicting school-wide needs. The numbers on the 1-5 scale represent the following:*

- 1 = We do not do this at our organization.
- 2 = We are starting to move in this direction.
- 3 = We are making good progress here.
- 4 = We have this condition well established.
- 5 = We are refining our practice in this area.

Please circle the rating for each item and tally the score for each column first, then add the results for each column together and transfer the results to the scoring box on the last page.

**Construct 1: Intense Focus on Vision**

In our central office, we:

- |  |           |
|--|-----------|
| 1. Develop our vision jointly  | 1 2 3 4 5 |
| 2. Ask each other questions that keep us on track with our vision  | 1 2 3 4 5 |
| 3. Think together about how to align district standards, instruction, assessment, and programs with our vision | 1 2 3 4 5 |
| 4. Keep our vision alive by reviewing it regularly   | 1 2 3 4 5 |

*Total (add circled numbers down and then across columns) = \_ \_ \_ \_ \_*

**Construct 2: Reflection and Innovation**

In our central office, we:

- |  |           |
|--|-----------|
| 1. Make time for ongoing reflection (e.g., journaling, peer coaching, collaborative planning)                                      | 1 2 3 4 5 |
| 2. Encourage individual and group initiative by providing access to resources, personnel, and time                                 | 1 2 3 4 5 |
| 3. Have joined with networks of other districts and programs, both inside and outside the district, to secure feedback on our work | 1 2 3 4 5 |
| 4. Practice and support new ways of doing things   | 1 2 3 4 5 |
| 5. Develop our own criteria for accountability regarding individual and shared work  | 1 2 3 4 5 |

*Total (add circled numbers down and then across columns) = \_ \_ \_ \_ \_*

**Construct 3: Shared Governance**

In our central office, we:

- |  |           |
|--|-----------|
| 1. Have established representative governance groups | 1 2 3 4 5 |
| 2. Seek to perform outside of traditional roles      | 1 2 3 4 5 |
| 3. Have developed new ways to work together          | 1 2 3 4 5 |

Total (add circled numbers down and then across columns) \_\_ = \_\_ \_ \_ \_ \_

**Construct 4: Monitors and Responds to Staff Achievement**

In our central office, we:

- |  |           |
|--|-----------|
| 1. Teach and assess so that all of us learn                        | 1 2 3 4 5 |
| 2. Provide feedback to each other about our progress               | 1 2 3 4 5 |
| 3. Talk with schools about student performance and school programs | 1 2 3 4 5 |

Total (add circled numbers down and then across columns) \_\_ = \_\_ \_ \_ \_ \_

**Scoring:** Add totals for each section. Possible scores can be found by multiplying the possible number of scores for each category by the number of staff completing the survey; the results for your particular school can be found by adding the actual scores of the staff completing the survey in each category (see the following table). Sections with the lowest scores are those in greatest need of attention. A score of 1 or 2 in the survey represents areas of greatest need, 3 and 4 represent strengths, and 5 represents exemplary work that reflects high leadership capacity. When you have completed the survey, discuss each section and identify possible areas for growth.

Construct	Possible Scores	School Scores
Intense Focus on Vision	30 x __ = __	
Reflection and Innovation	25 x __ = __	
Shared Governance	15 x __ = __	
Monitors and Responds to Student Achievement	15 x __ = __	

Appendix H  
**Senior Leaders Group Interview**

1. What do the SNA data reveal about the types of interactions that occur within the administrative team? Do you see patterns that should be enhanced? What are they?
2. What do the SNA data and the LCSS results tell you about the ways that capacity is generated or could be generated within the district administrative team?
3. How might you use the results of the social network analysis to further build capacity within the district administrative team?
4. What do you know differently about your organization as a consequence of the SNA?
5. How do you now view leadership capacity?
6. How might you employ the knowledge gained from the SNA to deal with the district's main challenges?
7. What changes might you make as a result of this study? Why?
8. In what ways does SNA inform the task of capacity-building?

Appendix I  
**Data Codes**

COA1	Central Office Administrator 1
COA2	Central Office Administrator 2
COA3	Central Office Administrator 3
COA4	Central Office Administrator 4
BA1	Building Administrator 1
BA2	Building Administrator 2
BA3	Building Administrator 3
BA4	Building Administrator 4
BA5	Building Administrator 5
COSS1	Central Office Support Staff 1
COSS2	Central Office Support Staff 2
COSS3	Central Office Support Staff 3
COSS4	Central Office Support Staff 4
COSS5	Central Office Support Staff 5
COSS6	Central Office Support Staff 6
FO	Field Observations

## VITA

Robert M. Hill is third-generation military, a graduate of the United States Military Academy at West Point, New York, and a career Army Officer. While on active duty, he obtained a Master's Degree in English from Duke University and taught English composition and literature at the U.S. Military Academy. After retiring, he worked briefly for Turner Broadcasting, then returned to education as Vice President of Enrollment Management and Marketing for Wentworth Military Academy, Lexington, Missouri. He served briefly as the Chief of Staff for the Savannah College of Art and Design in Savannah, Georgia before returning to the Army as a civil service employee. Today he combines his military background with his passion for teaching and learning by serving as an Instructor and Seminar Leader for the Functional Area 30 (Information Operations) Qualification Course, taught at Fort Leavenworth, Kansas.